You Can Run But You Can't Hide: A Meta-Analysis Examining Variability in Prevalence Rates, and Predictors of Traditional Versus Cyber Aggression in Adolescents

Jeanette Minchin

Bachelor of Psychology with Honours

Murdoch University

This thesis is presented in partial fulfillment of the requirements for the degree of Bachelor of Psychology (Honours), Murdoch University, 2012.

I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary educational institution.

_____

Jeanette Minchin

Copyright Acknowledgement

Full Name of Degree:	Bachelor of Psychology with Honours
Thesis Title:	You Can Run But You Can't Hide: A Meta-Analysis Examining Variability in Prevalence Rates, and Predictors of Traditional Versus Cyber Aggression in Adolescents
Author:	Jeanette Minchin
Year:	2012

Abstract

Purpose. Adolescent aggression is a serious social problem worldwide, with research showing that aggressive behaviour may have adverse psychosocial consequences for both victim and aggressor (Raskauskas, 2010). This paper presents a systematic review of 26 studies that examined adolescent involvement in traditional and cyber aggression within the same study, totalling 37,244 participants.

Methods. Weighted regression analysis was used to calculate mean effect sizes for each of four key types of aggression – traditional perpetration, traditional victimisation, cyber perpetration, and cyber victimisation.

Results. Results showed that for traditional perpetration, the mean prevalence rate effect size was two percent higher than cyber perpetration, and one percent higher for traditional victimisation than cyber victimisation. Although these effect sizes are considered small, they are still significant (Cohen, 1977). Findings also showed that inclusion of a definition, terminology used, and instrument used all related to the variability in prevalence across studies. However, different factors were associated with prevalence rates across the four types of aggression. Additionally, there were a number of factors that differentially predicted traditional versus cyber perpetration, and traditional versus cyber victimisation.

Conclusion. Instrument, definition, and terminology should be specific to the type of aggression that is being measured, particularly in the case of victimisation.

Keywords: traditional bullying, cyber bullying, adolescent aggression, prevalence

Acknowledgements

I would like to thank the three wonderful men in my life – Graham, Matthew and Cameron – whose unconditional love, patience, and support has seen me through the last couple of years. Without you, I would never have got this far.

And to Kathy Modecki, my supervisor. You were an amazing inspiration for me during the year. I always left your office feeling motivated and enthusiastic. Thanks for the journey – I wouldn't have missed it for the world!

Implications and Contribution

This meta-analysis established that a number of factors such as definition, terminology, and measurement contribute significantly to variability in prevalence rates for traditional perpetration and victimisation, and cyber perpetration and victimisation. These results provide greater clarity regarding measurement of adolescent aggression, and fill a notable gap in the research literature.

Introduction

Adolescent aggression is a serious social problem worldwide, with research showing that aggressive behaviour may have adverse psychosocial consequences for both victim and aggressor (Hinduja & Patchin, 2010; Raskauskas, 2010). A number of studies have found positive correlations between victims of adolescent aggression and levels of reported depression (Raskauskas, 2010; Seals & Young, 2003; Wang, Nansel, & Iannotti, 2011) and suicidal ideation (Hinduja & Patchin, 2010). These effects may continue into adulthood in the form of continued depression, psychosis, anxiety disorders, and self-esteem issues (Vanderbilt & Augustyn, 2010). For perpetrators, the long-term effects are equally as serious with studies finding higher levels of suicidal thoughts and suicide attempts (Hinduja & Patchin, 2010); and significantly higher risk levels for criminal behaviours and offending as adults, up to 11 years after the aggressive incidents took place (Ttofi , Farrington, Losel, & Loeber, 2011). The consequences of aggression that is mediated by cyber-technology are equally grave. Victims of Internet harassment report feeling embarrassed and humiliated (National Crime Prevention Council [NCPC], 2007), have poor and declining academic performance, higher reported levels of school behavioural problems such as detention and school absences, and are eight times more likely to carry a weapon to school (Ybarra, Diener-West, & Leaf, 2007).

Higher levels of depressive symptoms and social anxiety have also been found to be related to victims of cyber bullying (Erdur-Baker & Tanrikulu, 2010; Juvonen & Gross, 2008). Perpetrators of cyber aggression have been found to be delinquent in adolescence, continuing into early adulthood; and are not as socially mature as their peers (Raskuaskas & Stoltz, 2007).

While the negative effects of both traditional, face-to-face aggression, and cyber-mediated aggression are well documented, it is not clear yet whether this new form of aggression has replaced the old form, or is simply an extension of it. The school environment has traditionally been the location of adolescent aggression, where the perpetrator exerts power over a less powerful victim, using physical (hitting, kicking, punching), verbal (threats, taunts), or relational acts (gossip, social exclusion), usually with bystanders witnessing the incident (Law, Shapka, Hymel, Olson, & Waterhouse, 2012b). Once the school day had finished, the victim could arguably "escape" to the relative safety of their own home (Gross, Juvonen, & Gable, 2002). More recently however, a change has taken place. Schools now regularly use electronic technology such as computers, ipads, and the Internet as standard equipment within their curriculum (NCPC, 2007). Adolescents are also spending much of their out-of-school leisure time using the Internet for entertainment and as a backdrop to social interactions with others (Gross et al., 2002; Werner, Bumpus & Rock, 2010). Instead of talking to their friends face-to-face or on the telephone as earlier generations may have done, they are now using technology such as Internet chat rooms and instant messaging (IM) as their preferred modes of communication to have fun with and interact with their friends each day (Gross et al., 2002; Huang & Chou, 2010). In fact, the National Crime Prevention Centre (NCPC, 2007) found that 96% of teenagers have at least one email account, 25% send text messages while at school, and 97% use the Internet at home. Another

study found that 84% of younger adolescents aged between 11 and 13 years used the Internet on a "typical day" (p.82) with the majority of these (54%) IM an average of 2.68 people per day (Gross et al., 2002). Research is consistently finding a positive correlation between amount of time spent online and involvement in cyber aggression (Smith, Mahdavi, Carvahlo, Fisher, Russell, & Tippett, 2008; Werner et al., 2010). As such, it may be that the increased use, availability, and adolescent proficiency of technology such as mobile phones, email and Internet chatrooms has provided a new medium for peer aggression with potentially different consequences (Raskauskas, 2010; Wang et al., 2011).

Unfortunately, research into cyber aggression is still in its infancy, so that it remains unclear whether traditional and cyber forms of aggression are the same or different. Although there is a growing body of evidence pointing to two quite distinct constructs of aggression – one offline and the other online (Smith et al., 2008; Wang et al., 2011), other studies suggest that cyber and traditional aggression are the same phenomenon, and that technology is just another tool used to aggress others (Dempsey, Sulkowski, Dempsey, & Storch, 2011; Li, 2007). Moreover, researchers on both sides of the "new bottle, old wine" debate tend to cite prevalence rates of traditional versus cyber aggression perpetration and victimization in support of their respective positions. In fact, a relatively large number of studies have examined the different prevalence rates between traditional aggression and cyber aggression in adolescents. Unfortunately, across the variety of published studies conducted, there is enormous variation in prevalence rates. Illustratively, perpetration rates for traditional types of aggression have ranged anywhere from 9.68% to 89.6% (Perren, Dooley, Shaw, & Cross, 2010; Pornari & Wood, 2010; respectively) with fairly similar rates for victimization: 9% to 97.9% (Slonje & Smith, 2008; Pornari & Wood, 2010; respectively). Similarly, prevalence rates for cyber perpetration have

ranged from 5.3% to 31.5% (Gradinger, Strohmeier, & Spiel, 2009; Pornari & Wood, 2010; respectively), and 2.2% to 56.2% for cyber victimization (Perren et al., 2010; Pornari & Wood, 2010; respectively). Moreover, in the past, reported prevalence rates for traditional aggression in studies conducted in the USA have been higher than other countries (Hoover, Oliver, & Hazler, 1992). However, cyber aggression appears to be different in this regard, with a wide range of prevalence rates being reported across a wide range of countries (Katzer, Fetchenhauer & Belschak, 2009; Pornari & Wood, 2010). Such a wide inconsistency in reported prevalence rates may be a result of a number of different factors beyond actual prevalence differences between samples. For instance, methodological variability exists across a range of published and unpublished studies including definition, terminology, and measurement of aggression.

In order to interpret differences in prevalence rates across different forms of aggression, it is first vital to agree on how aggression should be operationalized. Past research has included a variety of definitions for aggression. For example, the Olweus (1993) definition is one of the most popular, stating that a "student is being bullied or victimized when he or she is exposed, repeatedly and over time, to negative actions on the part of one or more other students" (p.9). This definition was originally created for traditional types of bullying and may be unsuitable for cyber attacks. An added complexity when defining aggression and bullying is that children and researchers seem to emphasize different characteristics of the construct when asked to provide a definition (Vaillancourt et al., 2008). For example, even when the researcher emphasises intent, repetition, and power imbalance as the three main criteria associated with bullying, youth participants seemed to emphasize only the negative behaviour, as opposed to the three criteria. Moreover, research has found that teens tend to identify with the method or mode of online aggression, such as

sending text messages or images, rather than the actual role they play (i.e: bully or victim) (Law et al., 2012b; Law, Shapka, Domene, & Gagne, 2012a). Additionally, participants understanding of bullying may vary as a function of age and gender. The same issue relating to terminology exists in the cyber world. Terms such as Internet harassment (Ybarra, et al., 2007), cyberbullying (Smith et al., 2008), Internet bullying (Law et al., 2012b), and Internet aggression (Werner et al., 2010) have all been used in literature to date, and some authors have raised the possibility that such varying terminology has led to different interpretation of questions by adolescents undertaking the study (Vaillancourt et al., 2008; Ybarra et al., 2012).

At the same time, a widely accepted definition for aggression using electronic means has yet to be determined (Vandebosch & Van Cleemput, 2009, Ybarra, Boyd, Korchmaros & Oppenheim, 2012). In reality, definitions of aggression and bullying across studies have varied greatly, making it hard to delineate between the two (Cook, Williams, Guerra, Kim, & Sadek, 2010). For example, Law and colleagues (2012) question the use of the Olweus (1993) definition in relation to cyber aggression. They argue that this definition assumes that (1) all the characteristics of the definition (intent, repetition, and power imbalance) are present, and (2) they all function the same way in cyber aggression as in traditional aggression (Law et al., 2012a). For instance, Olweus' definition of an aggressive act is characterised as repeated over time. Although posting an insulting comment or image to an electronic message board via the Internet may be considered a single act from the perpetrator, the victim may re-experience the event repeatedly, because it has the potential to stay there for weeks compared to a verbal, face-to-face insult which "finishes" after it has been spoken (Vandebosch & Van Cleemput, 2009; Wang et al., 2011; Werner et al., 2010). Some definitions include the notion that there is a power imbalance between the perpetrator of the aggression and victim, such that the victim

is unable to defend him or herself, or stop the interaction (Patchin & Hinduja, 2006) while other definitions do not. In traditional aggression, the power imbalance is often thought to relate to a person exerting physical power (perceived or actual) over another, while in the cyber world, power imbalance is hypothesized to relate to the perpetrator's proficiency with electronic technology (Patchin & Hinduja, 2006). And, it is more common with cyber aggression, for the victim to react to the incident by attacking the attacker in retaliation, changing their status from a victim to a bully/victim (Law et al., 2012a), muddying the definition waters further. Nevertheless, it is commonly agreed that cyber aggression is undertaken with the intent to harm another, and it remains unclear whether the repetition and power imbalance (both of which are characteristics of traditional bullying) are also characteristics of cyber aggression (Law et al., 2012a). Because researchers have yet to agree on a standard definition, studies may well be measuring different constructs under a larger cyber aggression rubric.

Given the difficulties associated with delineating between bullying and aggression, and around cyber aggression itself, I will take the view that bullying behaviour is a part of the larger construct of aggression and the term *traditional aggression* will therefore be used to refer to acts involving physical, and non-electronic verbal and relational acts of aggression, and the term c*yber aggression* when referring to aggressive acts using electronic means.

Another characteristic that may be more relevant for cyber aggression relative to traditional aggression is the assumption that the identity of the perpetrator is known to the victim (Juvonen & Gross, 2008; Li, 2007; Raskausakas, 2010; Wolak, Mitchell, & Finkelhor, 2007). For example, some researchers argue that one of the main differences between traditional and cyber aggression is that the perpetrator can remain anonymous during a cyber-attack (Erdur-Baker, 2010; Werner et al., 2010).

Electronic technology is an effective means to distribute information to a wide range of people quickly and efficiently, while also permitting the user to protect their privacy, and allowing an individual to remain anonymous if they choose (Raskauskas, 2010). For instance, individuals can block their mobile phone number in a text message, set up a webpage anonymously, and use a pseudonym in an Internet chat room (Raskauskas, 2010). A person who is physically less powerful in the schoolyard may feel more empowered by the anonymity of a cyber setting (Werner et al., 2010). However, research in this area is inconsistent, with some studies finding that the majority of cyber victims did in fact know who their aggressor was (Juvonen & Gross, 2008; Li, 2007; Raskausakas, 2010), while others found that the majority did not know their aggressor (Wolak et al., 2007). These types of findings are important because it highlights a lack of clarity regarding how adolescents use electronic technology to aggress others.

Another issue relating to the difference in reported prevalence rates is the type of instrument used for measurement, and the specific language it contains (Vaillancourt et al., 2008; Ybarra et al., 2012). In particular, a widely accepted, valid, and reliable measure for cyber aggression has yet to be developed. Instead, measures have been taken in part from various existing sources, such as the Youth Internet Safety Study (Finkelhor, Mitchell, & Wolak, 2000), or created specifically for a particular study (Ybarra et al., 2007), which raises questions as to validity and reliability. An added complexity relates to how each aggressive incident is counted in the instrument. For example, Raskausakas (2010) reported that although they counted each aggressive incident as one unit, each single reported incident may involve anywhere between 1 and 20 aggressive text messages from multiple sources. Therefore, how the number of incidents are recorded may affect the frequency perpetration and victimisation from one study to another.

Additionally, because adolescent aggression is often defined as an act that is repeated over time, differences in prevalence rates may also be a function of the time frame used within each measure. Currently, time frames used in the literature to date have ranged anywhere between "the past 30 days" (Dempsey et al., 2011; Hinduja & Patchin, 2010; Werner et al., 2010) through to "in the last 12 months" (Hemphill et al., 2012) and "ever" (Beran & Li, 2005). Clearly, the potential difference in reported prevalence rates that exists between "over the last month" and "ever", is substantial, and this raises questions about consistency of measurement for both traditional and cyber aggression. Furthermore, to assess repetition, measures would ideally include some sort of cut-off point in order to categorise individuals into distinct groups containing victims and perpetrators. Currently, this cut off point appears to be at the researcher's discretion, arguably without sufficient theoretical justification (Newey & Magson, 2010).

In fact, how cyberbullying is defined and measured may explain a great deal of variance in reported prevalence rates. Illustratively, Ybarra and colleagues (2012) experimentally examined cyberbullying definition and measurement using four different surveys. They conducted two split-form studies that measured aggression using four different forms of survey to examine how differences in definition and terminology affect prevalence rates. A key finding was that for victimization, use of the word "bully" resulted in lower prevalence rates than no use of the word "bully" irrespective of whether a definition was included or not. Moreover, they suggest that studies conducted in the USA with English speakers should include the word "bully" in the instrument to ensure a thorough measure of victimization is utilized (Ybarra et al., 2012). Furthermore, when using a definition-based measure, cyber victims reported a higher level of false positives when specifically asked about power imbalance, repetition, and frequency over time (Ybarra et al., 2012). However,

other studies have found that prevalence rates for victimization were lower in the groups given a definition of bullying (Sawyer, Bradshaw & O'Brennan, 2008; Vaillancourt et al., 2008).

It also appears that youth may use their own experience of bullying to assess behaviours when not given a specific definition, which may explain the higher reported prevalence rates (Vaillancourt et al., 2008; Ybarra et al., 2012). When youth give their own definition of what constitutes bullying behaviour, they often do not include the three criteria normally used in research to define bullying: intention, repetition, and imbalance of power (Vaillancourt et al., 2008). In fact, a recent systematic review found that using a definition-based measure significantly moderated the effect of internalizing behaviours (such as depressive and anxious responses) compared to a definition-based measure using the word "bully" (Cook et al., 2010).

In addition to measuring prevalence rates for traditional and cyber aggression, existing cyber research has sought to establish predictors of aggression such as gender and age (Smith et al., 2008; Ybarra et al., 2007). For example, evolutionary theory has been used to explain gender differences in aggression (Archer, 2009; Campbell, 1999). Such an approach argues that males use more physical forms of aggression due to adapted needs – competition for mates; warding off intruders; and protecting their family, food supply, and shelter (Archer, 2009). Females, evolutionary theory argues, use a more indirect form of aggression (such as relational) in an effort to avoid putting themselves (and their family) in physical danger (Archer, 2009; Campbell, 1999). Based on evolutionary theory, boys should demonstrate higher rates of traditional physical perpetration and girls should demonstrate higher rates of both traditional and cyber relational perpetration. However, this theory is not fully supported by the research to date. Although boys

have been found to be more physically aggressive than girls in some studies, others have in fact found no gender differences for physical aggression (Pornari & Wood, 2010; Raskauskas & Stoltz, 2007; Slonje & Smith, 2008; Ybarra et al., 2007). Although girls are hypothesized to use more indirect forms of aggression, some studies find no gender differences for cyber aggression perpetration (Hemphill et al., 2012; Marsh, McGee, Nada-Raja, & Williams, 2010; Raskauskas & Stoltz, 2007; Smith et al., 2008; Williams & Guerra, 2007). Both Li (2006) and Kozlosky (2009) found that boys were significantly more likely to be the perpetrators of cyber aggression (which is not physical) than girls.

Similarly, other research has examined the meaning of aggression with different ethnicities and cultures to help explain the differences in cyber and traditional prevalence rates. In these instances, definitions and instruments measuring bullying and aggression need to be translated which may add subtle differences between the English version and the translated version (Huang & Chou, 2010; Smith, Cowie, Olafsson & Liefooghe, 2002). For example, the term "bully" is difficult to translate in some other languages. When translated into Japanese, it refers more to the relational and social types of aggression rather than physical acts. On the other hand, the Italian meaning most associated with bullying has a more physical connotation, while the French have no direct translation at all (Fonzi, Genta, Menesini, Bacchini, Bonino, & Constible, 1999; Morita, Soeda, Soeda, & Taki, 1999; Smith et al., 2002). This makes it problematic to assess the quality, and indeed the equivalency of an aggression instrument that is translated and used across different cultures. In fact, a study conducted in the USA, examined cultural differences in bullying reported that African-American girls and boys, and Asian boys were more likely to underestimate bullying victimisation than their White peers when using a definition-based measure compared to a behaviour-based measure

(Sawyer et al., 2008). With this in mind, it may be more useful to use a behavioural-based measure which gives specific examples of different types of behaviour, rather than relying on a definition–based measure which relies on the cultural meaning associated with it.

Additionally, over and above assessing study-level characteristics, it is also important to take into account the participants used in each study. There are two issues to consider when recruiting adolescents into aggression research: whether to seek active parental consent, or use passive parental consent. Both have their limitations and could ultimately result in sampling biases. First, obtaining active parental consent has considerably higher resource costs associated with it (Tigges, 2003; Secor-Turner, Sieving, Widome, Plowman, & Table Vanden Berk, 2010). Then, having obtained written (or active) parental consent, the teen needs to agree to participate. A meta-analysis examining adolescent risk behaviour showed that participation rates were consistently lower for active written consent (30 to 60%) compared to passive consent (between 93 and 100%), and often resulted in bias samples being used due to under or over-representation of certain subsets of participants (Tigges, 2003). For example, Tigges (2003) found differences between the parents who gave active consent and those who did not when examining adolescent risky behaviour. The adolescents who were given active parental consent were predominantly White, young, female, and less likely to take part in risky behaviour, while their parents were more likely to be well educated and living together with their children as a family unit (Tigges, 2003). A later study examining adolescent substance use supported this finding and found that more than half (59.1%) of the students refused participation in spite of their parents giving active consent, but only 19.7% refused when a passive consent procedure was used (Rojas, Sherrit, Harris, & Knight, 2008).

Given the range of prevalence rates and lack of understanding around contributors to such variability, research is sorely needed to make sense of existing evidence. Meta-analysis provides an excellent tool to examine the outcomes of different studies within the context of each other. As such, meta-analysis provides an estimated mean effect across those studies, while investigating the effects of potential moderating variables (Borenstein, Hedges, Higgins, & Rothstein, 2009; Lipsey & Wilson, 2001). One of the main benefits of meta-analysis is a more precise effect size due to a larger sample size from all the combined studies, with an improvement in statistical power as a consequence (Borenstein et al., 2009; Lipsey & Wilson, 2001). Although meta-analysis cannot improve the quality of the originating studies, it can highlight how differences in design between studies affects results, and thus guide how interventions are developed using such empirically based research.

The enormous range of prevalence rates and lack understanding as to how definition, terminology, and measurement relates to differences in prevalence rates, represents a notable gap in the research literature. Without greater clarity regarding how these study characteristics affect prevalence rates, additional studies add to this variability but do not necessarily increase understanding. Unfortunately, to date, there have been a limited number of meta-analyses undertaken to examine adolescent aggression in general, and no study has yet undertaken a systematic review of the existing literature to examine the variability in prevalence rates of involvement in traditional and cyber aggression within the same study. The current study fills this gap in the literature and aims to examine the following six questions:

(1) what is the difference in prevalence between traditional perpetration and cyber perpetration for adolescent aggression?

(2) what is the difference in prevalence between traditional victimisation and cyber victimisation for adolescent aggression?

(3) do study variables predict variability in traditional perpetration and victimisation, and cyber perpetration and victimisation?

(4) do study variables *differentially* predict variability in traditional and cyber perpetration, and traditional and cyber victimisation?

Based on 26 studies with 37244 participants, I examined key study-level constructs to determine whether they contributed to reported prevalence rates. Details of these variables are provided in table one.

Table 1

Rationale of Coding Variables

Variable	Rationale
Year of data collection	It is thought that as researchers get better understanding of adolescent aggression over the years, they will become better at estimating prevalence rates of involvement in aggression.
Location of study	To ascertain whether there is a relationship between country and reported prevalence rates. In the past, the USA has consistently reported higher prevalence rates for traditional aggression (Hoover et al., 1992).
Parental consent	Studies have shown that a considerably smaller amount of consent forms are returned from parents when seeking active parental consent compared to using a passive consent approach (Tigges, 2003). This may have an impact on selection bias.
Journal impact factor	Coded to establish whether there is a connection between the journal impact factor and the reported prevalence rates.
Type of instrument (Olweus or another type)	Because the Olweus measure has commonly been used in the past as the instrument of choice when measuring traditional adolescent bullying, this was collected to determine if the type of instrument had an effect on the reported prevalence rates.
Does instrument include the word "bully"?	Some studies have shown that including the word "bully" in the measure will result in more accurate reporting of prevalence (Cook et al., 2010; Sawyer et al., 2008; Vaillancourt et al., 2008).

Table 1 (Continued)

Variable	Rationale
Does the instrument include the wording "made fun of" or "teased"?	This was not coded if the phrase included "in a mean way" because adolescents often report that cyber aggression is done "for fun" or "entertainment" and for that reason, they do not consider it to be aggressive behavior (Smith et al., 2008).
Were examples given in instrument? Yes = behaviour-based measure No = definition-based measure	To determine whether there is a difference in prevalence between definition-based measures and behavior-based measures. By providing specific examples of behavior in the measure, this allows the adolescent to be clear about what is being asked. Some studies have found that including a definition ensures better clarity for the adolescents completing the measure, so that they don't have to rely on their own personal experiences or interpretation (Cook et al., 2010), whilst others have found that providing examples of behaviour is better (Sawyer et al., 2008; Vaillancourt et al., 2008).
Number of items in measure	Collected to determine if there is a connection between reported prevalence rates and the number of items in the measure. Number of items used to measure ranged from 1 (have you ever been involved in bullying/cyberbullying) to 24 (where specific bullying tools are assessed).
Time frame covered by measure	Time frame was recorded to examine the specific time period the measure covered separately for both traditional and cyber aggression. It is possible that more incidences of aggression may be reported when the time frame is bigger.
Incident occurred at school?	Collected to determine whether restricting the instrument to just the school environment or widening the environment to include out of the school environment has an impact on prevalence rates.
Mode of delivery	Different modes of delivery (such as physical, verbal, text message, Internet chatroom, instant message,) were coded to determine whether asking specifically about the various types of aggression being used made a difference to the way people reported perpetration or victimisation.

Method

Study Search and Retrieval

The analysis followed best-practice recommendations based on experts in the field of meta-analysis (Lipsey & Wilson, 2001). Three methods were used to locate possible eligible studies for this analysis. Firstly, a database search was conducted using PSYCInfo, Educational Resources Information Centre (ERIC), Proquest Dissertations and Theses, and Scopus using a combination of the following keywords: *adolescent, juvenile, teenage, bully, victim, perpetrator, aggression, cyber, online, Internet, text, and electronic*. Dissertations and theses were also included to lessen the chances of publication bias (Lipsey & Wilson, 2001). Secondly, a Google Scholar search was performed using the same keywords, with an automatic Google Scholar Alert set up for the keyword *cyber*bully*. Thirdly, the bibliography of each located article was reviewed for potential studies.

Inclusion Criteria

The initial search resulted in 95 potential studies, with another four studies located from the automatic Google Scholar Alert. Each study was individually scrutinized for meta-analysis eligibility, and the following criteria had to be met in order for the study to be included. (1) Because follow-up analyses will examine the correlation between cyber and traditional aggression, the study must have reported prevalence rates for both traditional and cyber types of aggression, with enough information included to calculate effect sizes; (2) the study participants must have been adolescents; (3) the study must be self-report measurement only; and (4) the study must have been published in English. Once these criteria were applied, 71 studies were excluded for various reasons and are detailed in figure one. Most were excluded because they reported cyber aggression only, or did not report prevalence

rates for both traditional and cyber aggression. The final number of studies analysed in this current meta-analysis was 26.

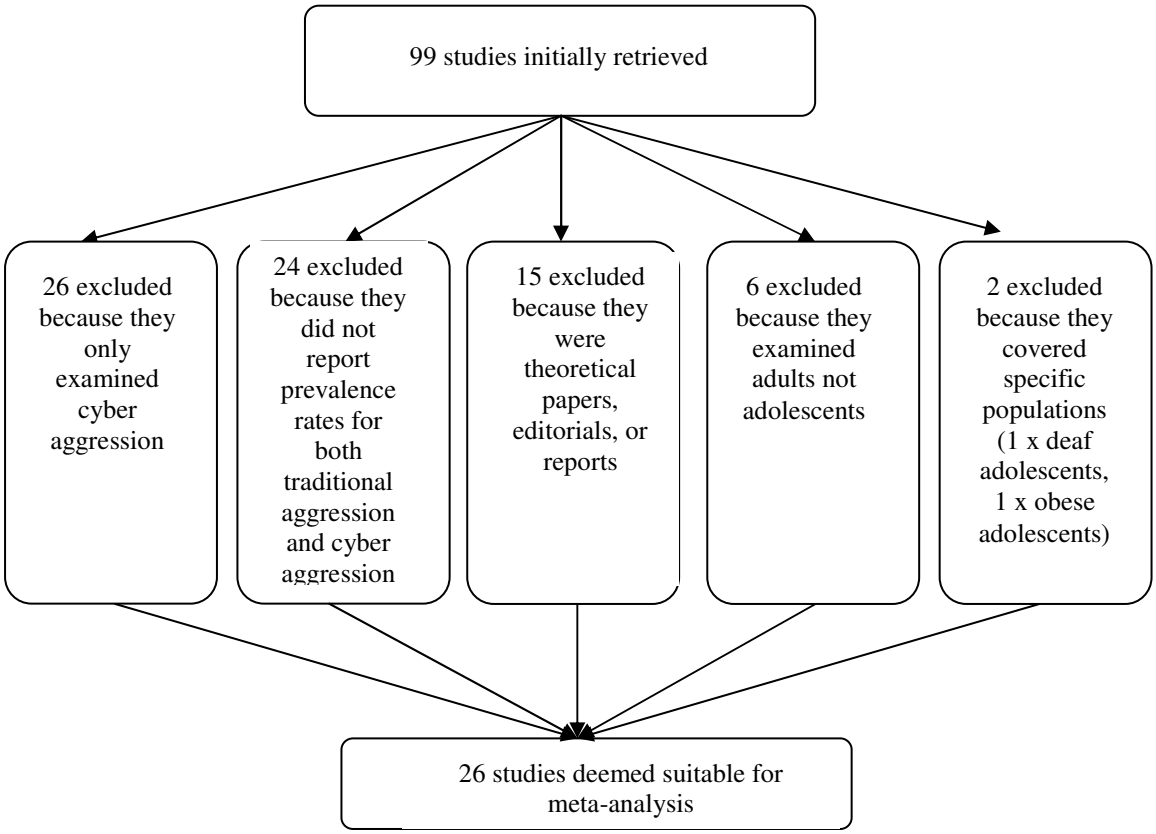

Figure 1. Flowchart showing retrieval and subsequent exclusion process of articles for the meta-analysis.

Study Coding Procedure

First a provisional coding form and coding manual were created by the author using a format suggested by Lipsey and Wilson (2001) that allowed the study variables to be detailed and coded (see appendix A: coding form and appendix B: coding manual). Next, the author and another independent coder undertook independent pilot coding tests of five studies, to ensure the coding form contained the required coding variables, and the coding manual was sufficiently detailed enough to allow coding to take place. When both coders were satisfied the coding

sheet and manual were detailed enough to contain all required information, the two researchers independently coded five additional studies, and compared agreement, discussing each coding decision. Finally, the two researchers continued to independently code the rest of the eligible studies. Each study was meticulously examined and relevant information extracted and recorded on the coding sheets according to the coding manual.

After the initial independent coding, the two coders compared individual coding sheets with each other to uncover any differences in coding. A number of coding decisions were made by the two coders during the process as questions arose, and have been detailed in the coding manual. Any differences were discussed between the two coders, with reference back to the original study to ensure an agreeable resolution was made. Before discussions relating to mismatches, codes matched 98% of studies equally. During the coding process, when coding information was found to be missing or unclear in a study, the primary author of the relevant study was contacted via email to request the required information. A positive response was elicited from nine of the eleven authors contacted. Those studies whose authors did not respond were represented by missing data. Given that certain coding variables related directly to the measures of the individual studies, all the instruments specified in each study were located where possible in order to check for specific wording and definitions contained within.

After coding was completed, the five studies initially piloted were recoded to ensure coding consistency, and were found to be 100% accurate by both coders. Data was entered into PASW (v18) for statistical analysis.

Effect Size Calculation and Statistical Analysis

There are four effect size statistics used in this meta-analysis based on the dependent variables: (1) prevalence rate traditional perpetration, (2) prevalence rate

traditional victimisation, (3) prevalence rate cyber perpetration, and (4) prevalence rate cyber victimisation. First, each dependent variable was divided by 100 to obtain a proportion. Lipsey and Wilson (2001) recommend converting the proportions to logits using a log transformation, as calculating an effect size directly from a proportion underestimates the confidence interval around the mean proportion. Moreover, using a log transformation procedure on the proportion gives the studies with larger sample sizes more weight in the analysis. Thus, a logit transformation is considered to be more conservative when there is a large variance around the mean (Lipsey & Wilson, 2001). A visual examination of frequency histograms established that distribution was relatively normal, and there were no outliers exceeding two standard deviations. Therefore, Windsorizing was deemed not necessary for this data (Wilson & Lipsey, 2001).

Next, for each dependent variable, we computed the mean effect size. Thus, a weighted mean effect size was calculated using the sum of the inverse variance weight of the effect size multiplied by the effect size, divided by the sum of the inverse variance weight of the effect size (Lipsey & Wilson, 2001). That is,

$$\overline{ES} = \frac{\sum wes_i}{\sum w_i}$$

Notably, the sampling error for studies using larger samples will be smaller (for example, they will be better or more precise estimates relative to studies using smaller samples). Thus, a weighted mean effect size is more accurate than one that is unweighted.

For ease of interpretation, Lipsey and Wilson (2001) recommend that the mean logits are converted back to proportions using the following equation. These proportions are detailed in table two.

$$p = \frac{e^{\text{logit}}}{e^{\text{logit}} + 1},$$

The standard error of the mean effect size, and corresponding z-tests were then calculated as follows:

$$SE_{\overline{ES}} = \sqrt{\frac{1}{\sum w_i}}$$

$$z = \frac{\overline{ES}}{SE_{\overline{ES}}}$$

Finally, Cochran's Q was calculated to assess homogeneity of the effect sizes. The Q statistic tests whether the distribution of effect sizes is homogeneous, such that individual effect sizes differ from the population mean only by sampling error. To the extent that a sample distribution is heterogeneous, the researcher is justified in explaining potential sources of this variability beyond error – typically, study level characteristics that may relate to effect size differences. The Q statistic was calculated based on the following equation:

$$Q = \sum wessq_i - \frac{(\sum wes_i)^2}{\sum w_i}$$

Based on a chi-square distribution (where df = number of effect sizes - 1), the Q statistic was significant for each dependent variable. Moreover, the heterogeneity in effect sizes was large, so that a fixed effects model could be realistically assumed. Table two details the results of these equations.

Table 2

Weighted Mean Effect Size (and Unweighted Proportion), Weighted Standard Error of the Mean Effect Size, z-test, and Test of Homogeneity (Cochran's Q)

Dependent Variable	Mean ES (*p*)	SE_{ES}	z	Q
Traditional perpetration	-0.21 (.45)	0.013	-15.92**	451.92**
Traditional victimisation	-0.21 (.45)	0.013	-16.15**	690.63**
Cyber perpetration	-0.80 (.31)	0.018	-44.44**	229.37**
Cyber victimisation	-0.57 (.36)	0.016	-3.610**	586.99**

Note. ** p<.001

Finally, a weighted regression analysis was conducted to examine the relationship between effect size and independent variables. Again, the effect size for each study is weighted based on relative sample size in these analyses. It is worth noting that the weighted regression process in PASW does not apply the correct weights. However, the correct statistic can be calculated manually using the parameters provided by PASW. Thus, the final step for deriving a significance test for each beta weight in our regression equation, was to correct the standard error derived from PASW for using the following formulas:

$$SE'_B = \frac{SE_B}{\sqrt{MS_E}},$$

$$z = \frac{B}{SE'_B},$$

SE'_B is the corrected standard error (SE), SE_B is the unstandardized *SE*, and MS_E is the mean square residual for the model, and *B* is the unstandardised coefficient of the regression model. Finally, to compare whether study level characteristics (independent variables) explained different amounts of variance in cyber versus traditional aggression (dependent variables), a difference score was

calculated and are shown in tables 4 and 5, and 13 and 14, in column 3. The z values, which can be thought of as beta weights for each independent variable controlling for other independent variables in the model.

The mean difference of the effect size was calculated using the arcsine of the proportion. The arcsine proportion is again a conservative transformation and is the recommended approach for comparing effect sizes for dependent variables that are proportions. That is,

$ES_{sm} = arcsine\ (ES_1) - arcsine\ (ES_2)$

Results

One of the primary aims of the study was to investigate whether there are significant differences in prevalence rates between traditional versus cyber aggression. Thus, the first set of analyses examined mean differences in the prevalence of traditional versus cyber aggression. First, the mean effect size for each dependent variable was transformed using the arcsine of the proportion as a conservative transformation (Lipsey & Wilson, 2001). Next, the mean difference was calculated for traditional versus cyber perpetration and for traditional versus cyber victimisation. Results showed that the mean difference in effect size for perpetration translated to a difference in proportion of approximately two percent. That is, prevalence rates for traditional perpetration were approximately two percent higher than prevalence rates for cyber perpetration, representing a small to moderate difference. For victimisation, the mean difference in effect size was approximately one percent. Prevalence rates for traditional victimization were one percent higher than prevalence rates for cyber victimization. To put these findings another way, traditional perpetration happened on average approximately two percent more than

cyber perpetration, and traditional victimization, on average, happened approximately one percent more than cyber victimization.

Study Level Descriptors Overview

Table three outlines descriptive information for the main study-level variables from the 26 studies used in this meta-analysis. Most of the studies were published, and due to the small number of unpublished studies, no further analysis was pursued to compare published versus unpublished studies. The majority of data for the studies used (approximately 88%) was collected between 2005 and 2008. Participants in the studies used for the meta-analysis have been drawn from a number of different countries, with the majority (57.6%) from countries other than the USA. Such variability in location justifies subsequent testing of cross-national differences in prevalence rates. From the total number of studies, 12 gave active parental consent (48%), 10 passive parental consent (36%), and 4 did not specify whether parental consent was sought or not (16%) and was thus treated as missing data.

Table 3

Study Level Descriptors

Independent Variable	*n* (group)	%
Publication type		
Journal	24	92.3
Thesis/Dissertation (unpublished)	2	7.7
Year of data collection		
2002	1	3.8
2003	0	0
2004	1	3.8
2005	7	26.9
2006	6	23.1
2007	4	17.4
2008	4	17.4
Location of study		
USA	11	42.3
Other	15	57.6
Parental consent given for study participation		
Active	12	46.2
Passive	10	38.5
Missing	4	15.4

As described earlier, a fixed effect weighted regression was undertaken for a number of different independent variables for the four dependent variables - traditional perpetration, cyber perpetration, traditional victimisation, and cyber victimisation. The risk of a type I error was increased given the number of regression analyses that were run on all four dependant variables. Therefore, an alpha level of .05 was divided by four (the number of dependent variables; $p<.0125$), and rounded to $p<.01$, resulting in a more conservative cut-off for significance and reducing the possibility of type I error.

Study Level Descriptors for Perpetration

As shown in table four, the year of data collection had a significant impact on the reported rates of perpetration (traditional: $p<.001$, cyber $p<.01$). The more recent the year of data collection, the higher the reported perpetration, and the difference in variance accounted for between traditional and cyber perpetration was significant. Similarly, when location of study was considered, prevalence was significant for both traditional ($p<.001$) and cyber ($p<.01$) indicating that studies undertaken in countries other than the USA reported higher levels of perpetration. However, the difference in variance accounted for by country of study for the two types of aggression was not significant. Type of parental consent however had a significant impact on traditional perpetration rates ($p<.01$), where active parental consent resulted in lower reported prevalence. Parental consent was significant for traditional aggression ($p<.001$) but did not impact cyber rates. However, consent predicted different amounts of variance in cyber versus traditional aggression. The journal impact factor only predicted cyber rates of perpetration ($p<.001$). Lower perpetration was reported in journals with higher impact factors, and impact factor predicted different amounts of variance in cyber versus traditional perpetration.

Table 4

Study Level Descriptors for Perpetration

	Traditional	Cyber	Difference Score
Independent Variable	*z*	*z*	*z*
Year of data collection	10.68**	3.19*	7.49**
Location of study[a]	4.33**	3.86**	0.48
Parental consent[b]	10.08**	-0.14	9.95**
Journal impact factor[c]	0.03	-3.20*	3.17*

Note. * $p< .01$, ** $p< .001$

[a] coded as 0=USA 1=Other [b] coded as 0=Passive 1=Active [c] Mean journal impact factor = 2.421.

Study Level Descriptors for Victimisation

Table five shows that for cyber victimization only, the more recent year of data collection took place, a significantly higher rate of victimization was reported (p<.001). Studies undertaken in the USA resulted in significantly lower rates of cyber victimization compared to studies from other countries (p=<.001). Active parental consent resulted in higher reported victimization for cyber (p<.01), but not for traditional aggression. Further, a high journal impact factor resulted in significantly higher victimization for cyber (p<.001) aggression only. Year of data collection, location of study, and journal impact factor were all found to predict different amounts of variance between cyber and traditional perpetration, when comparing z-scores.

Table 5

Study Level Descriptors for Victimisation

	Traditional	Cyber	Difference Score
Independent Variable	*z*	*z*	*z*
Year of data collection	0.44	10.43**	9.99**
Location of study[a]	-1.38	4.19**	2.81*
Parental consent[b]	1.26	2.97*	1.71
Journal impact factor[c]	2.27	4.98**	2.71*

Note. * p< .01, **p< .001

[a] coded as 0=USA 1=Other [b] coded as 0=Passive 1=Active [c] Mean journal impact factor = 2.421.

Instrument Descriptors Overview

An overview of the instrument descriptors is shown in table six. As detailed, the majority of studies did not use the Olweus instrument (69.2% traditional, 73.1% cyber), nor did they include the phrase “made fun of” or “teased” (69.2 traditional, 80.8% cyber). They did however, use instruments that gave examples (73.1%

traditional, 65.4% cyber), and used the word "bully" (61.5% traditional, 57.7% cyber).

Table 6

Instrument Descriptors for Traditional and Cyber Aggression

	Traditional		Cyber	
Independent Variable	*n* (group)	%	*n* (group)	%
Type of instrument				
Olweus	8	30.8	7	26.9
Other	18	69.2	19	73.1
Did the instrument include the word "bully"?				
Yes	16	61.5	15	57.7
No	10	38.5	11	42.3
Did the instrument include "was made fun of" or "teased"?				
Yes	8	30.8	5	19.2
No	18	69.2	21	80.8
Did the instrument give examples?				
Yes	19	73.1	17	65.4
No	7	26.9	9	34.6

Tables 7 to 12 describe the results for weighted regression analyses for each of the four dependent variables. It is worth noting that items in the same table were run as a group, so that the individual z-scores reflect the beta weight for each item controlling for other items in the analysis.

Effects of Independent Variables as a Function of Traditional Aggression

For traditional aggression, a weighted regression analyses was conducted for both traditional and cyber perpetration and victimisation. Both regressions used the variance predicted by four independent variables: type of instrument, inclusion of the word "bully", inclusion of the phrase "made fun of", and including examples in the instrument. The results of both are displayed in table seven. For both perpetration

and victimisation, using an instrument other than the Olweus measure resulted in higher reported prevalence rates. Providing examples was related to higher reported rates of traditional perpetration and victimisation. Inclusion of the word "bully" in the instrument was related to lower reported traditional victimisation, but including the phrase "made fun of" was significant, and resulted in higher reported rates of victimisation.

Table 7

z Values for Independent Variable's Relating to the Study Instrument for Traditional Aggression

	Perpetration	Victimisation
Independent Variable	*z*	*z*
Type of instrument[a]	2.72*	18.11**
Bully[b]	-1.14	-13.42*
Made fun of/teased[b]	0.22	9.34**
Examples[b]	2.60*	-1.11

Note. * $p < .01$, ** $p < .001$ [a] coded as 0=Olweus 1=Other [b] coded as 0=No 1=Yes

Next, weighted regression analyses were again conducted but using location at school, physical, verbal, and relational as independent variables. Findings are reported in table eight. As noted in table eight, all studies measuring verbal perpetration also simultaneously measured physical perpetration. Thus, the independent effect of verbal perpetration could not be tested. Results show that when controlling for location at school, none of the independent variables were associated with rates of perpetration. However, when the location was restricted specifically to the school environment, significantly higher rates of traditional victimisation were reported ($p<.001$). Notably, the highest reported victimisation rates were for verbal aggression whilst at school ($p<.001$). However, asking about

physical and relational aggression at school resulted in significantly lower reported victimisation (p<.001).

Table 8

z Values for Independent Variable's Relating to the Location and the Mode of Delivery for Traditional Aggression

	Perpetration	Victimisation
Independent Variable	*z*	*z*
Location at school[a]	1.47	13.44**
Physical[a]		-7.58**
Verbal[a]		10.38**
Physical and Verbal[ab]	1.80	
Relational[a]	-1.63	-3.30**

Note. **p< .001
[a] coded as 0=No 1=Yes [b] verbal and physical were perfectly correlated with each other

Lastly, table nine shows the results of two weighted regression analyses with number of items, location at school, and time frame as independent variables, and cyber perpetration and cyber victimisation as dependent variables. For victimisation, higher prevalence was reported for number of items (p<.001), location at school (p<.001), and time frame (p<.001). For perpetration, prevalence was significantly higher for a longer time frame (p<.01) and when not restricted to the school environment (p<.01).

Table 9

z Values for Independent Variable's Relating to the Number of Items in the Instrument and Time Frame of the Study for Traditional Aggression

	Perpetration	Victimisation
Independent Variable	*z*	*z*
Number of items	1.71	9.00**
Location at school[a]	-2.67*	12.19**
Time frame	2.82*	5.00**

Note. * $p < .01$, ** $p < .001$ [a] coded as 0=No 1=Yes

Effects of Independent Variables as a Function of Cyber Aggression

A weighted regression with type of instrument, inclusion of the word "bully", inclusion of the phrase "made fun of", and use of examples in the instrument as the independent variables, and cyber perpetration and cyber victimisation as the dependent variables is shown in table 10. When controlling for the type of instrument used (Olweus versus non-Olweus), only use of the phrase "made fun of" or "teased" resulted in higher reported cyber perpetration ($p<.001$). There was higher reported victimisation if the word "bully" was not used ($p<.001$) and if examples were given in the instrument ($p<.001$).

Table 10

z Values for Independent Variable's Relating to the Study Instrument for Cyber Aggression

	Perpetration	Victimisation
Independent Variable	*z*	*z*
Type of instrument[a]	1.64	0.09
Bully[b]	-0.16	-5.05**
Made fun of/teased[b]	6.40**	1.14
Examples[b]	1.47	7.65**

Note. **p< .001 [a] coded as 0=Olweus 1=Other [b] coded as 0=No 1=Yes

Table 11 describes results of the weighted regression of number of items, text, images, web site, phone calls, email, chatroom, IM, Internet, computers, electronic, and mobile phone as the independent variables, and cyber perpetration and cyber victimisation as the dependent variables. Number of items in the instrument is notionally confounded with asking about all the different modes of aggression, so was included as a control variable. Therefore, when controlling for the number of items in the instrument, specifically asking about the use of images and chatrooms to aggress others results in significantly higher perpetration rates than the cyber modalities. However, significantly lower perpetration was reported when studies specifically asked about perpetration using phone calls and mobile phones. I hypothesized that these relations might reflect year of use. However, neither phone calls nor mobile phones were correlated with year of data collection (r=-.280, p=.207 phone calls, r=-.051, p=.822 mobile phones).

There were significantly higher rates of victimisation reported if text, chatrooms and IM were specifically asked about in the instrument, above and beyond the effect of number of items. However, lower victimization was reported

for use of websites. Again, the correlation between year of data collection and use of websites was not significant (r=.184, p=.452). Number of items in the instrument is notionally confounded with asking about all the different modes of aggression, so was included as a control variable.

Table 11

z Values for Independent Variable's Relating to the Number of Items in the Study Instrument and the Mode of Delivery for Cyber Aggression

	Perpetration	Victimisation
Independent Variable	*z*	*z*
Number of items	-1.62	-2.07
Text[a]	-0.58	3.92**
Images[a]	3.14*	-0.80
Web site[a]	1.69	-3.60**
Phone calls[a]	-3.18*	-1.91
Email[a]	-2.40	-1.52
Chatroom[a]	5.28**	2.98*
Instant messaging[a]	-0.04	2.76*
Internet[a]	0.34	0.88
Computers[a]	1.68	-2.53
Electronic[a]	1.53	0.67
Mobile phone[a]	-4.22**	-1.09

Note. * p< .01, **p< .001 [a] coded as 0=No 1=Yes

Lastly, a weighted regression for number of items, location at school, and time frame as independent variables, and cyber perpetration and cyber victimisation as dependent variables was conducted. Table 12 shows that when controlling for number of items, location at school resulted in higher prevalence for perpetration and victimisation when not restricted to the school environment only (p<.001).

Table 12

z Values for Independent Variable's Relating to the Location and Time Frame of the Study for Cyber Aggression

	Perpetration	Victimisation
Independent Variable	*z*	*z*
Number of items	4.00**	-4.20**
Location at school[a]	-5.85**	-14.89**
Time frame	-0.69	0.69

Note. **$p < .001$ [a] coded as 0=No 1=Yes

Differences in Predictors

A key aspect of the study was to delineate potential differences in predictors of traditional versus cyber aggression. Thus, the last set of analyses compared the strength of association between the outcomes – traditional and cyber aggression – and independent variables (related to instrument). For these analyses, the z-scores presented in tables 7 through 12 were compared between the two parallel dependent variables (traditional versus cyber perpetration and traditional versus cyber victimisation). The difference between the two z-scores was then examined for significance using a z-distribution. The results of these comparisons, drawn from tables 7 to 12 are displayed in table 13 for perpetration and table 14 for victimisation.

Perpetration. The difference scores displayed in column three of table 13 reveal that only the independent variables "made fun of" and location at school differentially predicted variance between traditional and cyber perpetration. Specifically, use of the phrase "made fun of", and restricting the location to school predicted a greater amount of variation in traditional perpetration relative to cyber perpetration.

Table 13

Difference Between Traditional and Cyber Perpetration for Instrument

	Traditional	Cyber	Difference Score
Independent Variable	*z*	*z*	*z*
Type of instrument[a]	2.72*	1.64	1.08
Bully[b]	-1.14	-0.16	0.98
Made fun of/teased[b]	0.22	6.40**	6.18**
Examples[b]	2.60*	1.47	1.13
Location at school[b]	-2.67*	-5.85**	3.18*
Time frame	2.82*	-0.69	2.13
Number of items	1.71	4.00**	2.29

Note. * $p < .01$, ** $p < .001$ [a] coded as 0=Olweus 1=Other [b] coded as 0=No 1=Yes

Victimisation. The differences in variance accounted for in traditional versus cyber victimisation are presented in column three of table 14. As described in table 14, significant differences were found across all independent variables except the number of items indicating that the type of instrument, use of the word "bully", the phrase "made fun of", using examples of behaviour in the instrument, restricting the location to school, and time frame all predicted significantly greater ($p<.001$) variance in traditional versus cyber victimisation.

Table 14

Differences Between Traditional and Cyber and Victimisation for Instrument

	Traditional	Cyber	Difference Score
Independent Variable	*z*	*z*	z
Type of instrument[a]	18.11**	0.09	18.02**
Bully[b]	-13.42**	-5.05**	8.38**
Made fun of/teased[b]	9.39**	1.14	8.25**
Examples[b]	-1.11	7.65**	6.54**
Location at school[b]	9.00**	-14.89**	5.89**
Time frame	12.19**	0.69	11.50**
Number of Items	5.00**	-4.20**	0.80

Note. **$p < .001$ [a] coded as 0=Olweus 1=Other [b] coded as 0=No 1=Yes

Discussion

The aim of this study was to provide a systematic review of the literature on adolescent aggression to date. Based on a meta-analysis of 26 studies, comprised of 37,244 individuals, the mean prevalence rate for traditional perpetration and victimisation was 45%, whereas cyber perpetration was 31% and cyber victimisation was 36%. In terms of effect size, traditional aggression was two percent higher than cyber aggression for perpetration, and one percent higher relative to cyber victimisation. Results for this study suggest that variability in prevalence rates for cyber and traditional aggression can be partially explained by study characteristics such as year of data collection and location of study, and by instrument characteristics such as inclusion of a definition and use of the word "bully". Given that research is mixed regarding whether traditional and cyber forms of aggression

are the same or different, these results provide preliminary insight into this debate, and suggest that traditional versus cyber perpetration may be quite similar but that traditional and cyber victimisation are quite different.

Traditional Aggression

Study-level variables. Although mean prevalence rates were highest for traditional perpetration, all of the study-level variables (eg. year of data collection, location of study, parental consent) in the meta-analysis explained significant variability in rates of traditional perpetration. But, none of the study-level variables were associated with traditional victimisation. This suggests that traditional victimisation may be more "stable" – that is, less impacted by extraneous study effects.

Instrument-level variables. The pattern of effects for the instrument variables on traditional aggression were more mixed, and effects varied between traditional perpetration and traditional victimisation. Notably, using an Olweus instrument (and definition) resulted in lower reported prevalence rates for both traditional perpetration and victimisation. This is not altogether unexpected, as Olweus' more narrow definition of bullying only targets a select range of aggressive acts. Traditional aggression has always been linked to the school environment, so it was surprising to find that for perpetration significantly lower prevalence rates were reported when incidences were restricted to the schoolyard. Traditional victimisation showed an opposite relation and measures that were school-based were linked to higher reported prevalence rates. As hypothesized, instruments that provide a longer time frame did indeed result in significantly higher reported prevalence rates for both traditional perpetration and victimisation.

Findings around instrument modality also differed between traditional perpetration and victimisation. Specifically, modality was not related to variability

in prevalence rates for traditional aggression. However, all modes of delivery for traditional victimisation were associated with prevalence rates. Specifically, verbal aggression was associated with higher prevalence rates when asked about specifically in the instrument, whereas if physical and relational were not specifically asked about in the instrument, higher victimisation was reported. Speculatively, adolescents may consider gossip to be verbal aggression, and be unclear as to the underlying meaning of relational aggression, and thus, report it as verbal rather than relational.

Cyber Aggression

The mean effect size for cyber aggression was lower than for traditional aggression. That is, prevalence rates for traditional types of aggression were higher than types of cyber aggression. Likewise, cyber perpetration and victimisation showed a different pattern of effects relative to traditional perpetration and victimisation.

Study-level variables. For study-level factors (eg. year of data collection, location of study), cyber perpetration and victimisation showed fairly similar effects. For example, for both cyber perpetration and victimisation, a more recent year of data collection resulted in increased prevalence. Similarly, studies not conducted in the USA resulted in increased prevalence for cyber perpetration and victimisation. An exception to this pattern was that providing active parental consent was positively related to cyber victimisation but not to cyber perpetration, and a lower journal impact factor resulted in higher reported perpetration but not victimisation which reported lower prevalence rates.

Instrument-level variables. Similar to traditional aggression, terminology and definition used within the instrument affected rates of cyber perpetration and victimisation differently. One of the main hypotheses of the study was that

variability in rates of cyber aggression, in particular would be associated with differences in wording across instruments. For instance, previous research has found that teenagers see cyber bullying as entertainment, and that it is done for fun, without the intention of causing harm (Law et al., 2012a; Raskauskas & Stoltz, 2007; Smith et al., 2008). Likewise, cyber perpetrators have been found to justify their behavior by portraying the victim as "deserving it" or as retaliation or reaction to an early incident (Law et al., 2012a; Raskauskas & Stoltz, 2007; Smith et al., 2008), and downplay the impact of their actions, believing that it was no big deal (NCPC, 2007; Pornari & Wood, 2010). Results from this study support these views, indicating that cyber perpetration rates were higher when languages such as "made fun of" or "teased" were included in study instruments. Whereas for cyber victimisation, use of the word "bully" and examples of specific aggressive behaviours were related to lower prevalence rates. Previous studies have found that victims rely on their own phenomenological experience to make sense of their victimisation experiences (Vaillancourt et al., 2008) so that general victimisation experiences may be more salient compared to specific events or incidents labeled as "bullying".

Recent studies also suggest that adolescents distinguish between the *mode* of cyber of aggression and the *role* of cyber aggression (Law et al., 2012a; Law et al., 2012b). That is, instead of viewing themselves as a perpetrator or victim of aggression, they view themselves as a perpetrator or victim (or both) of a specific mode of delivery (for example, sender of text messages, or receiver of embarrassing images) (Law et al., 2012a; Law et al., 2012b). This may explain the mainly non-significant findings for the equipment used for aggression, such as computers, electronic, Internet. In contrast to involvement in aggression through Internet chatrooms, text messages, or images was associated with higher prevalence. At the same time, using websites as a tool for aggression was significant only for

victimisation with lower prevalence reported for websites. This finding is in line with that of Law and colleagues (2012a), who found that the creation and use of websites was more closely linked to traditional bullying than cyber aggression.

One of the central differences between traditional and cyber aggression is the environment in which they take place. For both cyber perpetration and victimisation, significantly higher prevalence rates were reported when involvement was not restricted to the school environment. This finding supports the idea that measures of electronic aggression should not be restricted to the schoolyard. Although, in contrast to traditional aggression, time frame had no effect on reported prevalence rates for either cyber perpetration or victimisation, and future research should unpack this further.

Use of the Olweus instrument (and definition) did not affect reported prevalence for either cyber perpetration or victimisation. A variety of instruments were used across the studies, with only a minority using the Olweus instrument. While there is currently a gap in the field of cyber aggression, such that a standardised instrument that is valid and reliable is sorely needed, the instruments used in these studies did not seem to adversely impact the reliability of study findings.

Differential Predictors of Traditional Versus Cyber Aggression

Lastly, there were a number of study-level and instrument-level variables that differentially predicted traditional versus cyber perpetration and traditional versus cyber victimisation. Specifically, most of the study-level variables (eg. year of data collection, use of the word “bully”) differentially predicted traditional versus cyber perpetration and traditional versus cyber victimisation. On the other hand the instrument-level characteristics were more mixed.

Different predictors of perpetration. At the study-level, the year data was collected, and active parental consent was differentially and positively related to traditional perpetration relative to cyber perpetration. Journal impact factor was negatively related to cyber perpetration relative to traditional perpetration. Higher impact factor predicted lower cyber perpetration rates for instrument-level variables, use of the words "made fun of" or "teased" was differentially and positively related to cyber perpetration relative to traditional perpetration. As mentioned earlier, this may relate to the finding that youth view cyberspace as fun and entertaining, and do not view cyber aggression in the same manner as traditional aggression. Also, limiting the location to school was associated with lower prevalence rates for traditional and cyber perpetration.

Different predictors of victimisation. A different pattern emerged when comparing traditional victimisation to cyber victimisation. At study-level, the year of data collection, study location, parental consent and journal impact factor were all differentially and positively related to cyber victimisation relative to traditional victimisation. That is, later data collection, study not conducted in the USA, active parental consent, and higher impact factor predicted higher rates of cyber victimisation in relation to traditional victimisation. Most of the instrument-level variables differentially affected the prevalence rates of traditional victimisation versus cyber victimisation. For example, the effects of type of instrument (and definition) used, and the terminology used within the instrument were more strongly associated with traditional versus cyber victimisation That is, the type of instrument used, inclusion of the words "made fun of" and time frame were all positively related to traditional victimisation but not to cyber victimisation. One exception to this was that using examples was more strongly associated with increased cyber victimisation compared to traditional victimisation. Also, similar to perpetration, restricting the

location to school predicted increased traditional victimisation but less cyber victimisation. Time frame, too, had a positive and stronger effect on traditional victimisation relative to cyber victimisation, such that a longer time frame was related to increased traditional victimisation but not to cyber victimisation.

Implications, Limitations and Conclusion

This current study addressed a notable gap in the existing literature and examined (1) differences in prevalence rates between traditional perpetration, traditional victimisation, cyber perpetration, and cyber victimisation; and (2) whether variability in prevalence rates of involvement in traditional and cyber aggression were related to study-level and instrument-level variables. In all, a number of factors contributed to variability in prevalence rates and different factors contributed to variability in perpetration versus victimisation, and traditional aggression versus cyber aggression.

Overall, as hypothesized, it appears that the type of instrument used, especially the definition and terminology used within an instrument directly affects prevalence rates across both traditional and cyber aggression. Traditional aggression and cyber aggression were more similar than different in factors such as measurement, definition, and terminology in relation to reported perpetration rates. This suggests that traditional aggression may be a fairly similar construct to cyber aggression. On the other hand, there were more differences than similarities in factors that predicted variance in prevalence rates of traditional and cyber victimisation. This suggests that victims of traditional aggression may be somewhat different to victims of cyber aggression.

There are however, several limitations which need to be considered when interpreting the results. First, the results of a meta-analysis are only as good as the results presented and methodology of the studies it analyses (Borenstein et al., 2009).

These results are based on studies that have used self-report data, and are derived from schools who have agreed to participate, a parental consent process (either active or passive) and adolescents who have agreed to participate in the study. All of these factors may contribute to an overall sample bias (Tigges, 2003). Second, this is a fixed effects model, and any inferences made from the results will relate only to the studies in the meta-analysis, and, consequently, not generalizable to populations outside of this study (Cook et al., 2010). Future studies may address this limitation by undertaking a random effects model in order to investigate any random differences associated with other factors within the studies (Lipsey & Wilson, 2001). Third, one of the inclusion criteria for this meta-analysis was that studies must have reported prevalence rates for both traditional and cyber aggression. This selection criteria was included because a future study using this data will examine the correlation between traditional and cyber perpetration and between traditional and cyber victimisation within each study. However, meta-analysis with inclusion criteria of any study reporting any prevalence rates for any type of aggression would be based on a larger sample size and might result in different conclusions from the current study. Lastly, given that the regression analyses were run on four dependent variables, the chance of a type I error was inflated. While this was partially addressed through the use of a more conservative alpha level of $p<.01$, results from this study must be interpreted with caution.

In conclusion, this meta-analysis, based on 26 studies with 37,244 participants, established that a number of factors contribute to variability in prevalence rates for traditional perpetration and victimisation, and cyber perpetration and victimisation. Moreover, different factors contributed to variability in prevalence rate across the four types of aggression. These findings have implications for future research and interventions aimed at adolescent aggression. If cyber aggression is a different

construct to traditional aggression, then it follows that separate and distinct interventions may need to be developed to target these different types of aggression. If however, cyber aggression is simply another tool used by traditional aggressors to harass others in an electronic environment, then intervention should emphasize ways to prevent adolescents engaging in this behaviour in both the physical and cyber environments (Demsey et al., 2011). Finally, instrument, definition, and terminology should ideally be specific to the type of aggression that is being measured, particularly in the case of victimisation.

References

Archer, J. (2009). Does sexual selection explain human sex differences in aggression? *Behavioral and Brain Sciences, 32*, 249-311. doi: 10.1017/S0140525X09990951

Beran, T., & Li, Q. (2005). Cyber-harrassment: A study of new method for an old behaviour. *Journal of Educational Computing Research, 32*(3), 265-277.

Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to Meta-Analysis*. Chichester, UK: John Wiley & Sons Ltd.

Campbell, A. (1999). Staying alive: Evolution, culture, and women's intrasexual aggression. *Behavioral and Brain Sciences, 22,* 203-252.

Cohen, J. (1997). *Statistical Power Analysis for the Behavioral Sciences* (Rev ed.). New York: Academic P.

Cook, C. R., Williams, K. R., Guerra, N. G., Kim, T. E., & Sadek, S. (2010). Predictors of bullying and victimization in childhood and adolescence: A meta-analytic investigation. *School Psychology Quarterly, 25*(2), 65-83. doi: 10.1037/a0020149

*Dempsey, A. G., Sulkowski, M. L., Dempsey, J., & Storch, E. A. (2011). Has cyber technology produced a new group of peer aggressors? *Cyberpsychology, Behavior, and Social Networking, 14*(5), 297-302. doi: 10.1089/cyber.2010.0108

Erdur-Baker, O. (2010). Cyberbullying and its correlation to traditional bullying, gender and frequent and risky usage of Internet-mediated communication tools. *New Media Society, 12*(1), 109-125. doi: 10.1177.1461444809341260

Erdur-Baker, O., & Tanrikulu, I. (2010). Psychological consequences of cyber bullying experiences among Turkish secondary school children. *Procedia Social and Behavioral Sciences, 2,* 2771-2776.

Finkelhor, D., Mitchell, K., & Wolak, J. (2000). Online victimization: A report on the nation's youth. *National Center for Missing & Exploited Children*. Retrieved August 20, 2012, from http://www.unh.edu/ccrc/Youth_Internet_info_page.html

Fonzi, A., Genta, M. L., Menesini, E., Bacchini, D., Bonino, S., & Constible, A. (1999). Italy. In P. K. Smith, Y. Morita, J. Junger-Tas, D. Olweus, R. Catalano, & P. Slee (Eds.), *The nature of school bulling: A cross-national perspective* (pp. 140-156). New York: Routledge.

*Gradinger, P., Strohmeier, D., & Spiel, C. (2009). Traditional bullying and cyber bullying. Identification of risk groups for adjustment problems. *Journal of Psychology, 217*(4), 205-213. doi: 10.1027/0044-3409.217.4.205

Gross, E. F., Juvonen, J., & Gable, S. L. (2002). Internet use and well-being in adolescence. *Journal of Social Issues, 58*(1), 75-90.

*Hemphill, S. A., Kotevski, A., Tollit, M., Smith, R., Herrenkohl, T. I., Toumbourou, J. W., & Catalano, R. F. (2012). Longitudinal predictors of cyber and traditional bullying perpetration in Australian secondary school students. *Journal of Adolescent Health, 51*(1), 59-65. doi: 10.1016/j.jadohealth.2011.11.019

*Hinduja, S., & Patchin, J. W. (2010). Bullying, cyberbullying, and suicide. *Archives of Suicide Research, 14*(3), 206-221. doi: 10.1080/13811118.2010.494133

Hoover, J. H., Oliver, R., & Hazler, R. J. (1992). Bullying: Perceptions of adolescent victims in the midwestern USA. *School Psychology International, 13*(5), 5-16. doi: 0.1177/0143034392131001

Huang, Y., & Chou, C. (2010). An analysis of multiple factors of cyberbullying among junior high school students in Taiwan. *Computers in Human Behavior, 26,* 1581-1590. doi:10.1016/j.chb.2010.06.005

Juvonen, J., & Gross, E. F. (2008). Extending the school grounds? Experiences in cyberspace. *Journal of School Health, 78*(9), 496-505.

*Katzer, C., Fetchenhauer, D., & Belschak, F. (2009). Cyberbullying: Who are the victims? A comparison of victimization in Internet chatrooms and victimization in school. *Journal of Media Psychology, 21*(1), 25-36. doi: 10.1027/1864-1105.21.1.25

*Kozlosky, R. (2009). *Electronic bullying among adolescents* (Unpublished doctoral dissertation). Marywood University.

Law, D. M., Shapka, J. D., Domene, J. F., & Gagne, M. H. (2012a). Are cyberbullies really bullies? An investigation of reactive and proactive online aggression. *Computers in Human Behavior, 28,* 664-672. doi: 10.1016/j.chb.2011.11.013

Law, D. M., Shapka, J. D., Hymel, S., Olson, B. F., & Waterhouse, T. (2012b). The changing face of bullying: An empirical comparison between traditional and Internet bullying and victimization. *Computers in Human Behavior, 28*, 226-232. doi: 10.1016/j.chb.2011.09.004

*Li, Q. (2006). Cyberbullying in schools. A research of gender differences. *School Psychology International, 27*(2), 157-170. doi: 10.1177/0143034306064547

*Li, Q. (2007). New bottle but old wine: A research of cyberbullying in schools. *Computers in Human Behavior, 23*, 1777-1791. doi: 10.1016/j.chb.2005.10.005

Lipsey, M. W., & Wilson, D., B. (2001). In L. Bickman and D. J. Rog (Eds.), *Practical Meta-Analysis*. Thousand Oaks, CA: Sage Publications.

*Marsh, L., McGee, R., Nada-Raja, S., & Williams, S. (2010). Brief report: Text bullying and traditional bullying among New Zealand secondary school students. *Journal of Adolescence, 33*, 237-240. doi: 10.1016/j.adolescence.2009.06.001

Morita, Y., Soeda, H., Soeda, K., & Taki, M. (1999). Japan. In P. K. Smith, Y. Morita, J. Junger-Tas, D. Olweus, R. Catalano, & P. Slee (Eds.), *The nature of school bulling: A cross-national perspective* (pp. 309-323). New York: Routledge.

*Murphy, A. N. (2009). *Electronic bullying and aggression in adolescents the demographic, behavioral, and cognitive predictors of electronic bullying, electronic victimization, and harm perception of electronic aggression.* (Unpublished master's thesis). Queen's University, Ontario, Canada.

National Crime Prevention Council [NCPC] (2007). Teens and cyberbullying. *Executive summary of a report on research conducted for the National Crime Prevention Council by Harris Interactive*. Retrieved 28 September, 2012, from www.ncpc.org/resources/files/pdf/bullying

Newey, K. A., & Magson, N. (2010). *A critical review of the current cyber bullying research: Definitional, theoretical and methodological issues. Where do we go from here?* Retrieved August 20, 2012, from http://www.aare.edu.au/10pap/2521NeweyMagson.pdf

Olweus, D. (1993). *Bullying at school. What we know and what we can do.* Oxford, UK: Blackwell Publishers.

*Ortega, R., Elipe, P., Mora-Merchan, J. A., Calmaestra, J., & Vega, E. (2009). The emotional impact on victims of traditional bullying and cyberbullying. A study of Spanish adolescents. *Journal of Psychology, 217*(4), 197-204. doi: 10.1027/0044-3409.217.4.197

Patchin, J. W., & Hinduja, S. (2006). Bullies move beyond the schoolyard: A preliminary look at cyberbullying. *Youth Violence and Juvenile Justice, 4*, 148-169. doi: 10.1177/1541204006286288

*Patchin, J. W., & Hinduja, S. (2011). Traditional and nontraditional bullying among youth: A test of general strain theory. *Youth Society, 43*, 727-751. doi: 10.1177/0044118X10366951

*Perren, S., Dooley, J., Shaw, T., & Cross, D. (2010). Bullying in school and cyberspace: Associations with depressive symptoms in Swiss and Australian adolescents. *Child and Adolescent Psychiatry and Mental Health, 4*(28), 1-10. doi: 10.1186/1753-2000-4-28

*Pornari, C. D., & Wood, J. (2010). Peer and cyber aggression in secondary school students: The role of moral disengagement, hostile attribution bias, and outcome expectancies. *Aggressive Behavior, 36,* 81-94. doi: 10.1002/ab.20336

*Raskauskas, J., & Stoltz, A. D. (2007). Involvement in traditional and electronic bullying among adolescents. *Developmental Psychology, 43*(3), 564-575. doi: 0.1037/0012-1649.43.3.564

*Raskauskas, J. (2010). Text-bullying: Associations with traditional bullying and depression among New Zealand adolescents. *Journal of School Violence, 9*(1), 74-97. doi: 10.1080/15388220903185605

Rojas, N. L., Sherrit, L., Harris, S., & Knight, J. R. (2008). The role of parental consent in adolescent substance use research. *Journal of Adolescent Health, 42*, 192-197. doi: 10.1016/j.jadohealth.2007.07.011

Sawyer, A. L., Bradshaw, C. P., & O'Brennan, L. M. (2008). Examining ethnic, gender, and developmental differences in the way children report being a victim of "bullying" on self-report measures. *The Journal of Adolescent Health, 43*(2), 106-114. doi: 10.1016/j.jadohealth.2007.12.011

Seals, D., & Young, J. (2003). Bullying and victimization: Prevalence and relationship to gender, grade level, ethnicity, self-esteem, and depression. *Adolescence, 38*(152), 735-747.

Secor-Turner, M., Sieving, R., Widome, R., Plowman, S., & Vanden Berk, E. V. (2010). Active parental consent for health surveys with urban middle school students: Processes and outcomes. *Journal of School Health, 80*(2), 73-79.

*Slonje, R., & Smith, P. K. (2008). Cyberbullying: Another main type of bullying? *Scandinavian Journal of Psychology, 49*, 147-154. doi: 10.1111/j.1467-9450.2007.00611.x

Smith, P. K., Cowie, H., Olafsson, R. F., Liefooghe, P. D. (2002). Definitions of bullying: A comparison of terms used, and age and gender differences, in a fourteen-country international comparison. *Child Development, 73*(4), 1119-1133. doi: 10.1111/1467-8624.00461

*Smith, P. K., Mahdavi, J., Carvalho, M., Fisher, S., Russell, S., & Tippett, N. (2008). Cyberbullying: Its nature and impact in secondary school pupils. *The Journal of Child Psychology and Psychiatry, 49*(4), 376-385. doi:10.1111/j.1469-7610.2007.01846.x

*Sontag, L. M., Clemans, K. H. Graber, J. A., & Lyndon, S. T. (2011). Traditional and cyber aggressors and victims: A comparison of psychosocial characteristics. *Journal of Youth Adolescence, 40*, 392-404. doi: 10.1007/s10964-010-9575-9

Tigges, B. B. (2003). Parental consent and adolescent risk behavior research. *Journal of Nursing Scholarship, 35*(3), 283-289.

Ttofi, M. A., Farrington, D. P., Losel, F., & Loeber, R. (2011). The predictive efficiency of school bullying versus later offending: A systematic/meta-analytic review of longitudinal studies. *Criminal Behaviour and Mental Health, 21*, 80-89. doi: 10.1002/cbm

Vaillancourt, T., McDougal, P., Hymel, S., Krygsman, A., Miller, J., Stiver, K., & Davis, C. (2008). Bulling: Are researchers and children/youth talking about the same thing? *International Journal of Behavioral Development, 32*(6), 486-495. doi: 10.1177/0165025408095553

Vandebosch, H. & Van Cleemput, K. (2009). Cyberbullying among youngsters: Profiles of bullies and victims. *New Media & Society, 11*(8), 1349-1371. doi: 10.1177/1461444809341263

Vanderbilt, D., & Augustyn, M. (2010). The effects of bullying. *Paediatrics and Child Health, 20*(7), 315-320.

*Wang, J., Iannotti, R. J., & Nansel, T. R. (2009). School bullying among adolescents in the United States. Physical, verbal, relational, and cyber. *Journal of Adolescent Health, 45*, 368-375. doi: 10.1016/j.jadohealth.2009.03.021

*Wang, J., Nansel, T. R., & Iannotti, R. J. (2011). Cyber and traditional bullying: Differential association with depression. *Journal of Adolescent Health*, *48*, 415-417. doi:10.1016/j.jadohealth.2010.07.012

*Werner, N. E., Bumpus, M. F., & Rock, D. (2010). Involvement in Internet aggression during early adolescence. *Journal of Youth and Adolescence, 39*, 607-619. doi 10.1007/s10964-009-9419-7

*Williams, K. R., & Guerra, N. G. (2007). Prevalence and predictors of Internet bullying. *Journal of Adolescent Health, 41*, S14-S21. doi: 10.1016/j.adohealth.2007.08.018

Wolak, J., Mitchell, K. J., & Finkelhor, D. (2007). Does online harassment constitute bullying? An exploration of online harassment by known peers and online-only contacts. *Journal of Adolescent Health, 41*, S51-S58. doi: 10.1016/j.jadohealth.2007.08.019

Ybarra, M. L., Boyd, D., Korchmaros, J. D., & Oppenheim J. K. (2012). Defining and measuring cyberbullying within the larger context of bulling victimization. *Journal of Adolescent Health 51*, 53-58. doi: 10.1016/jadohealth.2011.12.031

*Ybarra, M. L., Diener-West, M, & Leaf, P. J. (2007). Examining the overlap in Internet harrassment and school bullying: Implications for school intervention. *Journal of Adolescent Health*, *41*, S42-S50. doi:10.1016/j.jadohealth.2007.09.004

Instructions to Authors: Journal of Adolescent Health

Editorial Policies

General Information

The Journal of Adolescent Health publishes Original Articles, Adolescent Health Briefs, Review Articles, Clinical Observations, and Letters to the Editor.

Duplicate/Prior/Overlapping Publication or Submission

Manuscripts are submitted for review with the understanding that they are being submitted only to the *Journal of Adolescent Health*. The *Journal* will not consider for review any manuscript that has been published elsewhere, that is currently under consideration by another publication, or that is in press. Poster and platform presentations and abstracts are not considered duplicate publications, but should be noted in the manuscript's cover letter and Acknowledgements section of the manuscript.

If the submitted manuscript contains data that have been previously published, is in press, or is currently under review by another publication in any format, the authors are required to submit a reprint of the published article or a copy of the other manuscript to the Editor-in-Chief with a clarification of the overlap and a justification for consideration of the current submitted manuscript.

The Editors encourage authors to report fully the complete findings of their studies. The editors recognize that large and longitudinal datasets often result in multiple publications both on different topics and on the same topics across the span of development. Therefore, it is the authors' strict responsibility both to notify the

editors of the existence of multiple manuscripts arising from the same study and to cross-reference all those that are relevant.

Manuscripts accepted for peer review may be submitted to the iThenticate plagiarism checker. iThenticate compares a given manuscript to a broad range of published and in-press materials, returning a similarity report, which the editors will then examine for potential instances of plagiarism and self-plagiarism.

Failure to disclose multiple or duplicate manuscripts may result in censure by the relevant journals and written notification of the appropriate officials at the authors' academic institutions.

Authorship Criteria

As a condition of authorship, all listed authors must have seen the final draft of the manuscript, approve of its submission to the *Journal of Adolescent Health*, and be willing to take responsibility for it in its the entirety.

The *Journal* limits manuscripts to 6 named authors. If you would like to request permission to submit an article with more than 6 authors, please send a detailed description of each author's contribution to tor.berg@ucsf.edu. Under no circumstances will the *Journal* consider manuscripts listing more than 10 named authors.

For manuscript's accepted for peer review, a signed Statement of Authorship will be requested from each named author. The *Journal's* Statement can be downloaded in PDF format here. We prefer an electronic copy of the statement: please

electronically sign the PDF using Acrobat or print the PDF, sign it by hand, and scan it. We can also receive statements by fax at (415) 476-6106, though it may delay processing of your manuscript.

If there are concerns about how all persons listed as authors meet the criteria for authorship according to the Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication available at www.icmje.org, we will request further information from the corresponding author and, if necessary, request written documentation of each person's work on the report.

The names, along with any conflicts of interest, funding sources, and industry-relation, of persons who have contributed substantially to a study but who do not fulfill the criteria for authorship are to be listed in the Acknowledgments section. This section should include individuals who provided any writing, editorial, statistical assistance, etc.

Ethical Approval of Studies, Informed Consent, and Identifying Details

Studies of human subjects must document that approval was received from the appropriate institutional review board. When reporting experiments utilizing human subjects, it must be stated in writing, in the Methods section, that the Institution's Committee on Human Subjects or its equivalent has approved the protocol. The protocol for obtaining informed consent should be briefly stated in the manuscript. The Editor-in-Chief may require additional information to clarify the safeguards about the procedures used to obtain informed consent. Within the United States, the authors should verify compliance with the Health Insurance Portability and Accountability Act of 1996 (HIPPA) prior to submission. When reporting

experiments on animal subjects, it must be stated that the institution's animal care and use committee has approved the protocol.

Authors must immediately disclose to the *Journal of Adolescent Health* in writing the existence of any investigation or claim related to the manuscript with respect to the use of human or animal subjects that may be initiated by an institutional, regulatory, or official body at any time, including investigations or claims arising subsequent to manuscript submission, approval or publication.

Clinical Trials Registration

In order to foster a comprehensive, publicly available database of clinical trials, journals Increasingly are requiring the registration of clinical trials. At this time, registration is not required for submission or publication in the *Journal of Adolescent Health*. However, the Editors strongly recommend registration of clinical trials in an appropriate registry. Please provide the site of registration and the registration number on the title page.

One such registry is ClincalTrials.gov, a service of the U.S. National Institutes of Health, at http://www.clinicaltrials.gov/. A number of other registries are available.

Conflict of Interest/Disclosure Policy

According to the World Association of Medical Editors (WAME):

"...a conflict of interest (competing interest) is some fact known to a participant in the publication process that if revealed later, would make a reasonable reader feel

misled or deceived (or an author, reviewer, or editor feel defensive). Conflicts of interest may influence the judgment of authors, reviewers, and editors; these conflicts often are not immediately apparent to others. They may be personal, commercial, political, academic, or financial. Financial interests may include employment, research funding (received or pending), stock or share ownership, patents, payment for lectures or travel, consultancies, nonfinancial support, or any fiduciary interest in the company. The perception of a conflict of interest is nearly as important as an actual conflict, since both erode trust."

Authors are required to disclose on the title page of the initial manuscript any potential, perceived, or real conflict of interest. Authors must describe the role of the study sponsor(s), if any, in 1) study design; 2) the collection, analysis, and interpretation of data; 3) the writing of the report; and 4) the decision to submit the manuscript for publication. Authors should include statements even when the sponsor had no involvement in the above matters. Authors should also state who wrote the first draft of the manuscript and whether an honorarium, grant, or other form of payment was given to anyone to produce the manuscript. If the manuscript is accepted for publication, the disclosure statements may be published.

Fast-Tracking for Critical Issues in Adolescent Health and Medicine : *The Journal of Adolescent Health* has developed a fast-tracking system in order to facilitate and encourage the submission of high quality manuscripts with documented findings that may change the content of clinical practice or assist with the national and/or international dialogue about critical issues affecting adolescents and young adults. Manuscripts accepted for a fast-track review will be forwarded to two reviewers from our Editorial Board, who are given two weeks to conduct an

expedited review. The *Journal* will notify authors of the outcome of the review within three weeks of submission. If the review is favorable, fast-track authors will be asked to complete any necessary revisions within two weeks.

Upon acceptance, fast-track manuscripts are prioritized for publication, and should appear in print within two months.

Fast tracking is a rare event intended for high-priority findings and should not be viewed simply as a mechanism for an expedited review. The article should be prepared in the same manner as an Original Article.

The Editorial Process

Acceptance for Review

Manuscripts submitted to the *Journal of Adolescent Health* are reviewed internally for interest and relevance. Approximately half of all submitted manuscripts are returned to the authors without full peer review. That decision is made quickly, within two weeks of submission.

Peer review and Decision

Manuscripts accepted for peer review are sent to three external reviewers. Reviewers are anonymous; authors' names are revealed. The *Journal*'s goal is to complete peer review and reach a decision within seven weeks of submission.

Manuscripts will either be declined based on reviewer comments or referred back to the authors for revision. This is an invitation to present the best possible paper for further review; it is not an acceptance.

Authors are asked to complete revisions within 30 days. If the authors do not respond within 30 days, the editors may decline to consider the revision. The editors reciprocate by providing a final decision quickly upon receipt of the revision.

Acceptance for Publication

All manuscripts accepted for publication will require a written assignment of the copyright from the author(s) to the Society for Adolescent Health and Medicine. Elsevier Inc. will maintain all records of the copyright for the Society for Adolescent Health and Medicine. No part of the published material may be reproduced elsewhere without written permission from the publisher.

Authors will receive typeset galley proofs via e-mail from the *Journal*'s issue manager at Elsevier. Proofs should arrive approximately four to six weeks following acceptance.

The article will be published in the print edition of the *Journal* approximately five to seven months after acceptance.

Articles Online First

The Journal of Adolescent Health publishes articles online ahead of print publication in the Articles Online First section of our web site. Articles are published online approximately four to six weeks following the galley proofs. The online article is identical to the version subsequently published in the print journal, and is citable by the digital object identifier (DOI) assigned at the time of online publication.

Reprints

Reprints may be ordered prior to publication by using the special reprint order form that accompanies proofs.

Release to Media

Until the time of publication on the *Journal of Adolescent Health's* website, it is a violation of the copyright agreement to disclose the findings of an accepted manuscript to the media or the public. If you require an embargo date for your article, please contact the *Journal*'s editorial office.

Supplements

The Journal of Adolescent Health publishes funded supplements after approval and review by the Editorial Office. Initial inquiries and proposals for supplements should be directed the editorial office and to Elsevier's Senior Supplements Editor:

Craig Smith

Elsevier Supplements Department

360 Park Avenue South

New York, NY 10010

Tel: (212) 462-1933

Fax: (212) 462 1935

E-mail: c.smith@elsevier.com

Manuscript Preparation

General information

Manuscripts are submitted to the journal electronically. Manuscript documents must

comply with layout and length requirements outlined below. All accepted manuscripts may be subject to editing and revision by the editors and their agents. Authors should take care to avoid redundancy within the text and between the tables, figures, and text. Due to page limitations, the editors may decide that figures, appendices, tables, acknowledgements, and other materials be published online only and referenced in the print edition of the *Journal*.

Online submission

Manuscripts must be submitted online via the Elsevier Editorial System (EES). To access EES, go to http://ees.elsevier.com/jah/ and register as a new user. You will be guided stepwise through the creation and uploading of the various files and data. Once the uploading is done, the system automatically generates an electronic (PDF) proof, which is then used for reviewing. All correspondence regarding submitted manuscripts will be handled via e-mail through EES.

For the purposes of EES, a manuscript submission consists of a minimum of two distinct files: a Cover Letter, and the Manuscript itself including the Title Page (with any Acknowledgements) and the Abstract. EES accepts files from a broad range of word processing applications. Both files should be set in 12-point double-spaced type and all pages should be numbered consecutively). The file should follow the general instructions on style/arrangement, and, in particular, the reference style.

In addition, Tables and Figures should be included as separate and individual files.

If Electronic submission is not possible, please contact Mr. Tor Berg, the managing editor at tor.berg@ucsf.edu, or by phone at 415-502-1373 or by mail at Editorial

Office, *Journal of Adolescent Health*, University of California, San Francisco, Research and Policy Center for Childhood and Adolescence, 3333 California Street, Suite 245, San Francisco, California 94118.

Cover Letter

A Cover Letter must accompany all submissions. The Cover Letter should describe the manuscript's unique contribution and provide the following information in accordance with the Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication available at http://www.icmje.org

- Disclosure of any prior publications or submissions with any overlapping information, including Methods, or a statement that there are no prior publications or submissions with any overlapping information;
- A statement that the work is not and will not be submitted to any other journal while under consideration by *The Journal of Adolescent Health*;
- A statement of any potential conflict of interest, real or perceived, the role of the study sponsor, and additional disclosures, if any; potential conflicts must also appear on the Title Page.

Title Page/Acknowledgements

The title page should contain a concise but informative title (titles are limited to 150 characters). Include the full names of all authors, as well as the highest academic degrees and the departmental and institutional affiliation of each. Please note that the *Journal* does not list fellowships of professional or certifying organizations as credentials. Relevant sources of financial support and potential conflicts of interest

should be reported for all authors (see the *Journal*'s Conflict of Interest/Disclosure Policy).

Named authors must have made a significant contribution to the manuscript (see the *Journal*'s Authorship Criteria). A list of more than 6 authors should be specifically justified in the manuscript's cover letter. Under no circumstances will the *Journal* consider a manuscript listing more than 10 named authors.

One author must be designated as the corresponding author, and should provide a complete postal address, telephone number, fax number, and e-mail address. The corresponding author will conduct all correspondence with the Editorial Office on behalf of the other authors. If the manuscript is accepted, page proofs and reprint order forms will be sent to the corresponding of author.

The title page should also include an Acknowledgements section, listing any sources of support such as grants, equipment, or drugs; and any acknowledgements of persons who have made a substantive contribution to the study. Authors should obtain written permission from anyone that they wish to list in the Acknowledgement section. The corresponding author must also affirm that he or she has listed everyone who contributed significantly to the work in the Acknowledgements. Previous oral or poster presentations at local, regional, national or international meetings should be reported here.

Abstract and Key Words

The abstract should be provided in a structured table format with the following bolded headings: Purpose, Methods, Results and Conclusions. Emphasis should be

placed on new and important aspects of the study or observations. Only common and approved abbreviations are acceptable. Three to 10 key words or short phrases should be identified and placed below the abstract. These key words will be used to assist indexers in cross-indexing the article and will be published with the abstract. For this, terms from the Medical Subject Headings list in the Index Medicus should be used whenever possible.

Manuscript

The text of original articles and briefs should usually - but not necessarily - be divided into the following sections: **Introduction**, **Methods**, **Results**, and **Discussion.** Additionally, the *Journal* requests an **Implications and Contribution** summary statement.

Implications and Contribution: In addition to the abstract, please include a summary statement at the beginning of your manuscript. This summary should be no more than 50 words in length and should describe the significance of your study's findings and its contribution to the literature in plain language. These summaries appear on the published articles and in various digests and newsletters.

Introduction: The Introduction should clearly state the purpose(s) of the article and summarize the rationale for the study of observation. Only pertinent references should be used.

Methods: The selection of observational or experimental subjects (patients or experimental animals, including controls) should be clearly described in the Methods section. The methods, apparatus, and procedures used should be described in enough

detail to allow other workers to reproduce the results. References should be provided for established methods, including statistical methods. Methods that are not well known should be concisely described with appropriate references. Any new or substantially modified method(s) should be carefully described, reasons given for its use, and an evaluation made of its known or potential limitations. All drugs and chemicals used should be identified by generic name(s), dosage(s), and route(s) of administration. The numbers of observations and the statistical significance of findings should be included when appropriate. Patients' names, initials, or hospital numbers should not be used.

*Note that when reporting experiments utilizing human subjects, approval of the protocol by the sponsoring Institution's Committee on Human Subjects or its equivalent must be stated explicitly within the Methods section of the manuscript. In addition, the protocol for obtaining informed consent should be briefly described.

Results: Results should be presented in a logical sequence in the text, table(s), and illustration(s). Only critical data from the table(s) and/or illustrations(s) should be repeated in the text.

Discussion: Emphasis in the Discussion section should be placed on the new and important aspects of the study and the conclusions that can be drawn. Detailed data from the results section should not be repeated in the discussion. The discussion should include the implications and limitations of the findings and should relate the observations to other relevant studies. The link between the conclusion(s) and the goal(s) of the study should be carefully stated, avoiding unqualified statements and conclusions not completely supported by the data. The author(s) should avoid

claiming priority and alluding to work that has not yet been completed. New hypotheses, when stated, should be clearly identified as such. Recommendations, when appropriate, may be included.

Potential Reviewers

To assist with a prompt, fair review process, authors are asked to provide the names, institutional affiliations, and e-mail addresses of 5 potential reviewers who have the appropriate expertise to evaluate the manuscript. Failure to provide 5 potential reviewers may result in delays in the processing of your manuscript. Do not refer potential reviewers with whom you have a current or past personal or professional relationship. Do not recommend members of the *Journal*'s editorial board. Authors may also provide the names of persons who should not be asked to review the manuscript. Ultimately, the Editors reserve the right to choose reviewers.

Article Types

The Journal of Adolescent Health publishes the following types of articles. Word count limits apply only to the main body of the manuscript, and do not include the title, references, or figure and table captions.

Original Articles are scientific reports on the results of original research. Text is limited to 3500 words with a 250-word structured abstract, 5 tables/figures, and 40 references. Original articles should include a 50-word **Implications and Contribution** summary statement.

Adolescent Health Briefs are scientific reports of original research that represent preliminary findings, small samples and newly described associations in unique

populations. Briefs are limited to 1000 words, with a structured abstract of 150 words or less. A combined total of 2 figures and/or tables, and a maximum of 10 references will be accepted. Briefs should include a 50-word **Implications and Contribution** summary statement.

Review articles generally are solicited by the editors. If you would like to submit a review article the *Journal*, please submit a proposal letter, a detailed outline, and a preliminary reference list to the Managing Editor by e-mail at tor.berg@ucsf.edu. Systematic reviews and meta-analyses are preferred, though strong, evidence-based integrative and narrative proposals will be considered.

One or more of the Associate Editors will review the proposal and will advise the authors on proceeding to a full manuscript. This internal review will take place within four weeks of receipt of the proposal.

The final format of the article should include the introduction, review of the relevant literature, discussion, summary and implications section. Each review article must have a 200-word summary abstract. Review articles are limited to 4500 words, 5 tables/figures, and an unlimited number of references. Review articles should include a 50-word **Implications and Contribution** summary statement.

Clinical Observations: These case reports represent rare and new observations in the clinical arena. Papers in this format are limited to 1000 words and should include an introduction, concise discussion of the clinical observation, and discussion. Clinical observations should include a 200-word summary abstract. A combined total of 1 figure, table or illustration and 10 references will be accepted.

Editorial Correspondence: Letters regarding articles published in the *Journal* within the proceeding 6 months are strongly preferred. Letters should not exceed 400 words. This correspondence is published at the discretion of the Editor-in-chief and the Associate Editors. The authors of the article that is subject of the correspondence will be invited to respond.

Invited Commentaries: Commentaries are invited only, and will be solicited solely by the editors. Commentaries serve as a forum for changes in adolescent healthcare training, economic issues, governmental health policies, international health, medical/scientific ethics, and meeting reports.

Journal Style

All aspects of the manuscript (tables, illustrations, and references) should be prepared according to the International Committee of Medical Journal Editors (ICMJE) requirements.

Grammar, Punctuation, and Usage. Grammar, punctuation, and scientific writing style should follow the AMA Manual of Style, 10th edition.

Abbreviations. Authors should provide a list of abbreviations on the title page. All acronyms in the text should be expanded at first mention, followed by the abbreviation in parentheses. The acronym may appear in the text thereafter. Do not use abbreviations in the title. Acronyms may be used in the abstract if they occur 3 or more times therein. Generally, abbreviations should be limited to those defined in the *AMA Manual of Style*, 10th edition. Uncommon abbreviations should be listed at the beginning of the article.

Units of Measure. Authors should use Système International (SI) values.

Proprietary Products. Authors should use nonproprietary names of drugs or devices unless mention of a manufacturer is pertinent to the discussion. If a proprietary product is cited, the name and location of the manufacturer must also be included.

References. Authors are responsible for the accuracy of references. References should be numbered consecutively in the order in which they are first mentioned in the text. Identify references in text, tables, and legends by Arabic numerals in parentheses. References cited only in tables or figure legends should be numbered in accordance with the sequence established by the first identification in the text of the particular table or figure. The titles of journals should be abbreviated according to the style used in the list of *Journal*s Indexed for MEDLINE, posted by the NLM on the Library's web site.

Reference style should follow that of the , 10th edition, as shown in the following examples. The titles of journals should be abbreviated according to the style used in the list of Journals *AMA Manual of Style*Indexed for MEDLINE, posted by the NLM on the Library's web site. http://www.nlm.nih.gov/tsd/serials/lji.html

Journal

1. *Standard journal article:*

References should list all authors when three or fewer; when four or more, only the first three should be listed, followed by et al.

Aalsma MA, Tong Y, Wiehe SE, et al. The Impact of Delinquency on Young Adult Sexual Risk Behaviors and Sexually Transmitted Infections. J Adolesc Health 2010;46:17-24. DOI:10.1016/j.jadohealth.2009.05.018.

2. *Corporate Author:*

Center for Health Promotion and Education: Guidelines for effective school health education to prevent the spread of AIDS. J Sch Health 1988;58:142-8.

Books and Monographs

1. *Personal Author(s):*

Romer D, ed. Reducing Adolescent Risk: Toward an Integrated Approach. Thousand Oaks, California, Sage Publications, 2003.

2. *Editor(s) Compiler(s), Chairman as Author(s):*

Rosen DS, Rich M, eds. The Adolescent Male. Adolescent Medicine: State of the Art Reviews. Vol 14. Philadelphia, Hanley & Belfus, 2003:3.

3. *Chapter in a Book:*

Marcell AV, Irwin CE Jr. Adolescent Substance Use and Abuse. In: Finberg L, Kleinman RE, eds. Saunders Manual of Pediatric Practice, 2nd edition. Philadelphia: WB Saunders, 2002:127-139.

4. *Agency Publication:*

America's Children: Key National Indicators of Well-Being 2009. Washington, DC: Federal Interagency Forum on Child and Family Statistics, 2009.

Web site

World Health Organization. Good information practice essential criteria for vaccine safety web sites. Available at: http://www.who.int/vaccine_safety/good_vs_sites/en.

Accessed January 13, 2010.

An effort should be made to avoid using abstracts as references. Unpublished observations and personal communications are not acceptable as references, although references to written, not verbal, communications may be inserted into the text in parentheses. References to manuscripts accepted but not yet published should designate the journal followed by (in press). All references must be verified by the authors against the original documents.

Tables

Any tables should be submitted as separate and individual files. Tables should be numbered consecutively, in order of citation in the text. Each table should be given a brief title; explanatory matter should be placed in a table footnote. Any nonstandard abbreviation should be explained in a table footnote. Tables should not rely on vertical lines for clarity or coherence and should contain as few horizontal lines as possible. Statistical measures should be identified as measures of variation such as S.D. or S.E.M. If data from another published or unpublished source are used, permission must be obtained and the source fully acknowledged. EES will accept files from a wide variety of table-creation software.

Figures

Any figures should be submitted as separate and individual files. Letters, and symbols should be clear and even throughout and of sufficient size that when figures are reduced for publication (to approximately 3 inches wide), each item will still be legible. Figures should be numbered consecutively, in order of citation in text. Each figure must have a legend typed in a separate document that you will upload to EES

immediately after the illustration that it references. When symbols, arrows, numbers, or letters are used to identify parts of the illustrations, each should be identified and clearly explained in the legend.

The cost of color illustrations must be borne by the author(s).

If photomicrographs are to be submitted, the requirements for their presentation should be obtained from the Editor-in-Chief prior to submission.

If photographs of persons are used, either the subjects must not be identifiable or their pictures must be accompanied by written permission to publish the photograph.

If an illustration has been published, the original source must be acknowledged and accompanied by written permission from the copyright holder to reproduce the material. Permission is required regardless of authorship or publisher except for documents in the public domain. Guidelines for submitting your illustrations in an electronic format can be found by clicking on Artwork Guidelines at ⇉ http://www.ees.elsevier.com/JAH/.

Checklist for Manuscript Submission

o Review author guidelines, article requirements, and instructions for submitting manuscripts through the Elsevier editorial system, located at ⇉ http://ees.elsevier.com/jah/.

o Cover letter

- Disclosure of any prior publications or submissions with any overlapping information
- A statement that the work is not under consideration elsewhere
- Disclosure of any potential conflict of interest, real and perceived, for all named authors

o Names and contact information for 5 potential reviewers

o Title page:

- Article title
- Full names, academic degrees, and affiliations of all authors
- Name, address, e-mail address, telephone and fax number of the corresponding author
- Sources of funding and acknowledgements of support and assistance
- Disclosure of potential conflicts, real and perceived, for all named authors
- Clinical trials registry site and number
- List of abbreviations

o Abstract, structured for original articles and briefs, summary for review articles and clinical observations

o List of keywords

o Manuscript

- Please double-space
- Implications summary statement
- IRB statement in the Methods section
- References should be on a new page
- Figure legends should be on a new page

o Tables, including title and legend, each saved as a separate document

o Figures, each saved as a separate file

o Copies of prior and/or in press publications related to the current submission can be uploaded as separate files or e-mail to the Managing Editor at tor.berg@ucsf.edsu

Appendix A : Coding Sheet

Study ID		**Reference**	
Publication Type (0) Journal (1) Thesis/dissertation (2) Other (specify)		**Study quality** (0) Poor (1) Below average (2) Average (3) Very Good (4) Excellent	
Year of Publication **Year of Data Collection**		**Journal Regular Impact Factor**	
Country covered by study (0) USA (1) Other (specify)		**Sample size**	
Age of Sample		**Mean Age**	
Ethnicity - % Caucasian		**Ethnicity majority** (0) Caucasian (1) Minority	
Gender % Male Female			
Parental Consent (0) Passive (1) Active (2) Not specified (missing)			
Instrument - Traditional		**Instrument - Cyber**	
Type of instrument (0) Olweus (1) Other (specify) **Include the word "bully"** (0) No (1) Yes		**Type of instrument** (0) Olweus (1) Other (specify) **Include the word "bully"** (0) No (1) Yes	
"was made fun of/teased"? (in instrument) (0) No (1) Yes		**"was made fun of/teased"?** **(in instrument)** (0) No (1) Yes	
Were examples given? (0) No (1) Yes		**Were examples given?** (0) No (1) Yes	
Type of measure (0) Definition-based (1) Behaviour-based		**Type of measure** (0) Definition-based (1) Behaviour-based	
Types of groups **Bully** (0) No (1) Yes **Victim** (0) No (1) Yes **Not specified** (0) No (1) Yes		**Types of groups** **Bully** (0) No (1) Yes **Victim** (0) No (1) Yes **Not specified** (0) No (1) Yes	

Appendix A (Continued)

Aggression Mode – Traditional		**Aggression Mode - Cyber**	
Perpetrator - Physical (0) No (1) Yes		**Perpetrator – Text message** (0) No (1) Yes **Perpetrator – Images** (0) No (1) Yes **Perpetrator – Websites** (0) No (1) Yes	
Perpetrator - Verbal (0) No (1) Yes		**Perpetrator – Phone calls** (0) No (1) Yes **Perpetrator – Email** (0) No (1) Yes **Perpetrator – Chat room** (0) No (1) Yes	
Perpetrator - Relational/Social (0) No (1) Yes		**Perpetrator – Instant messaging** (0) No (1) Yes **Perpetrator – Internet** (0) No (1) Yes **Perpetrator – Computer** (0) No (1) Yes	
Perpetrator – Not Specified (0) No (1) Yes		**Perpetrator – Electronic** (0) No (1) Yes **Perpetrator – Mobile Phone** (0) No (1) Yes	

Appendix A (Continued)

Aggression Mode – Traditional		**Aggression Mode – Cyber**	
Victim - Physical **(**0) No (1) Yes		**Victim – Text message** (0) No (1) Yes **Victim – Images** (0) No (1) Yes **Victim – Websites** (0) No (1) Yes	
Victim - Verbal **(**0) No (1) Yes		**Victim – Phone calls** (0) No (1) Yes **Victim – Email** (0) No (1) Yes **Victim – Chat room** (0) No (1) Yes	
Victim - Relational/Social **(**0) No (1) Yes		**Victim – Instant messaging** (0) No (1) Yes **Victim – Internet** (0) No (1) Yes **Victim – Computer** **(**0) No (1) Yes	
Victim – Not Specified (0) No (1) Yes		**Victim – Electronic** (0) No (1) Yes **Victim – Mobile Phone** (0) No (1) Yes	
No. of items in trad measure Perp Vict		**No. of items in cyber measure** Perp Vict	
Time frame covered by measure (0) daily (1) weekly (2) 1 month (3) 2 months (4) 3 months (5) 6 months (6) 12 months (7) ever		**Time frame covered by measure** (0) daily (1) weekly (2) 1 month (3) 2 months (4) 3 months (5) 6 months (6) 12 months (7) ever	

Appendix A (Continued)

Traditional		**Cyber**	
Assignment to Condition (Perp) (1) Once or more (2) twice or more (3) three times or more **Over what time period?** (0) daily (1) weekly (2) 1 month (3) 2 months (4) 3 months (5) 6 months (6) 12 months (7) ever **Assignment to Condition (Victim)** (1) Once or more (2) twice or more (3) three times or more **Over what time period?** (0) daily (1) weekly (2) 1 month (3) 2 months (4) 3 months (5) 6 months (6) 12 months (7) ever		**Assignment to Condition (Perp)** (1) Once or more (2) twice or more (3) three times or more **Over what time period?** (0) daily (1) weekly (2) 1 month (3) 2 months (4) 3 months (5) 6 months (6) 12 months (7) ever **Assignment to Condition (Victim)** (1) Once or more (2) twice or more (3) three times or more **Over what time period?** (0) daily (1) weekly (2) 1 month (3) 2 months (4) 3 months (5) 6 months (6) 12 months (7) ever	
Location of Traditional Aggression		**Location of Cyber Aggression**	
At school (0) No (1) Yes		**At school** (0) No (1) Yes	
Prevalence/Frequency - Traditional		**Prevalence/Frequency - Cyber**	
Reported <u>perpetrator</u> frequency (& page no.)		**Reported <u>perpetrator</u> frequency (& page no.)**	
Type of aggression reported (0) physical (1) verbal (2) relational (3) combined			
Reported <u>victim</u> frequency (& page no.)		**Reported <u>victim</u> frequency (& page no.)**	
Type of aggression reported (0) physical (1) verbal (2) relational (3) combined			

Appendix B : Coding Manual

Variable	Coding Procedure
Study Characteristics	
Study ID	Assign a unique study identification number starting at 1 to each study individually. If there is more than one study detailed in the article, use a decimal point then another number...eg: 2.1 and 2.2 if article 2 details two separate studies.
Reference	Use the whole bibliographic reference in APA style.
Publication type	Code as *Journal*, or *Thesis/dissertation.*
Study quality	Code quality of study *Excellent, Very good, Average, Below average*, or *Poor*.
Year of publication	What is the publication year? Code as *9999* if unknown.
Year of data collection	What is the year of data collection? If date range stated, then code as the oldest date (eg: 2005 to 2006 is coded as 2005). If the year is not reported, then code as one year prior to publication date.
Journal impact factor	Code the journal impact factor as found via an Internet search.
Country of study	Code the country that the study was conducted in as *USA* or *Other*. If *Other*, then specify country.
Study Sample	
Final sample size	Record the final number of participants that were used in the final outcome analyses.
Age of sample	Record the age of the sample as reported. Use an age range if necessary.
Mean age of sample	Enter the mean age of the sample if stated in the report. If not stated, then calculate manually from the middle of the age range.
Ethnicity	Record the percentage of Caucasian reported. Code *9999* if not reported.
Ethnicity majority	Code the ethnic majority as either *Caucasian* or *Minority*. If percentage is >50%, then code *Caucasian*, otherwise code *Minority*.
Gender composition	Record the gender composition as a percentage for both female and male.
Type of consent	Code Type of Consent as *Active* (where specific parental/adult consent is gained and reported as such), or *Passive* (where consent is assumed unless specific opt out by participant), else code *Not Specified.*

Appendix B (Continued)

Variable	Coding Procedure
Definition and Measures	
Type of instrument	Code either *Olweus* or *Other*. If *Other*, specify which instrument was used.
Include the word "bully"	Check the definition and measure for use of the word "bully" for both Traditional and Cyber. Code as *Yes* or *No*.
"Was made fun of/teased"	Check the instrument for use of the words "was made fun of" or "teased" for both Traditional and Cyber. Code as either *Yes* or *No*. Code as *No* if it is made clear that it was *in a mean way*.
Were examples given?	Report whether examples of specific aggressive behaviours were given in the measures for both Traditional and Cyber. Code as either *Yes* or *No*. If just the tools/mode of aggression is stated in the measure (eg: used email to cyberbully another) then code *No*.
Type of measure	Code either *definition-based* (provided a definition only) or *behaviour-based* (provided a list of behaviours and no definition) for both Traditional and Cyber.
Design Descriptors	
Types of groups	Code types of groups into either *Bully* or *Victim* for Traditional and Cyber.
Aggression mode	Code the type of aggression reported for both perpetrator and victim for Traditional as *Physical, Verbal, Relational/Social*, and *Not Specified*, and Cyber as *Text Message, Images, Websites, Phone Calls, Email, Chat Room, Instant Messaging, Internet, Computer, Electronic,* and *Mobile Phone*.
Number of items in measure	Code the number of items in each measure for perpetration and victimisation, or both Traditional and Cyber.
Time frame covered by measure	Report the time frame covered by the measure for both Traditional and Cyber (splitting into perpetration and victimization if required) as *Daily, Weekly, 1 month, 2 months, 3 months, 6 months, 12 months*, and *ever*. If "couple of months" stated then code as *2 months*. If "recently" stated then code as *2 months*. If a time range is stated (eg: 2 to 3 months) then code for the longest time period (*3 months*). If "past school year" or "in the last semester" is stated, then code as *6 months* (if not clearly specified otherwise).

Appendix B (Continued)

Variable	**Coding Procedure**
Assignment to condition	Record the frequency reported that relates to how each participant was assigned to either the bully or victim group. Code as *once or more (1+), twice or more (2+),* or *three times or more (3+).*
Time period	To assess repetition, code as *Daily, Weekly, 1 month, 2 months, 3 months, 6 months, 12 months*, and *ever*.
Location of aggression	Code *Yes* or No to indicate whether the instrument specifically asked if the aggressive incident took place At School or not.
Data Collection	
Reported prevalence rate	Record prevalence rates as a percentage for both perpetration and victimization, for Traditional and Cyber. When traditional prevalence rates are separated into separate categories, then report the highest rate.
Type of aggression reported	When traditional prevalence rates are separated into separate categories, then report the type of aggression (*Physical, Verbal*, and *Relational*) that is reported as the highest rate for both perpetration and victimisation.